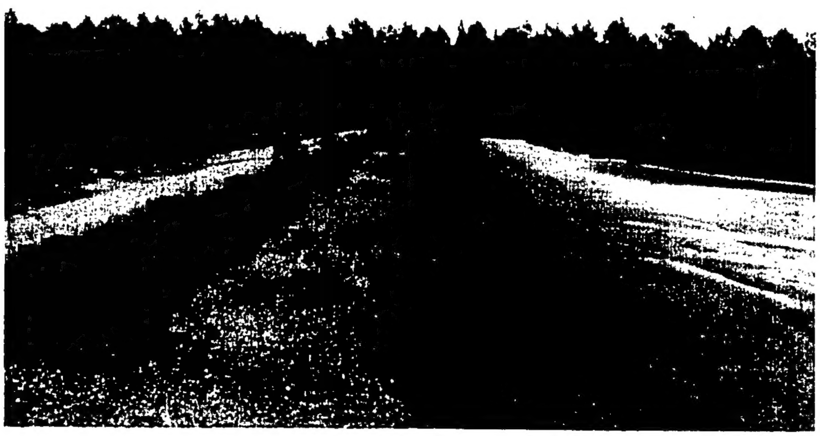
Final Technology Evaluation Report
Volume II

Physical Separation and Acid Leaching: A Demonstration of Small-Arms Range Remediation at Fort Polk, Louisiana



Prepared for

Naval Facilities Engineering Service Center

and

U.S. Army Environmental Center

by

Battelle
. . . Putting Technology To Work

Columbus,Ohio

September 22, 1997

Sponsored by

ESTCP

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13. ABSTRACT *(Maximum 200 words)*

The U.S. Army Environmental Center in partnership with the Naval Facilities Engineering Services Center and the U.S. Army Engineer Waterways Experiment Station demonstrated Physical Separation/Leaching methods for the remediation of small arms range soils. The demonstration occurred at Fort Polk, Louisiana. After conducting a world-wide search, two vendors were selected to demonstrate two variations of the physical separation/leaching technologies. The first using a process based on acetic (weak) acid chemistry and the second based on hydrochloric (strong) acid chemistry. Following completion of the bench treatability studies, each vendor performed a full scale (5-10 tons per hour, 1000 tons total) demonstration of their respective technologies.

Volume 1 of the Technology Evaluation Report provides a comprehensive description and evaluation of the physical separation/acid leaching technology demonstrated at Fort Polk to include: 1) the equipment and processes necessary to accomplish physical separation/acid leaching, 2) the demonstration site and berm soil characteristics, 3) the performance objectives and approach, 4) each vendor's process plant used in the demonstration, 5) the methodology used to evaluate the technologies during the demonstration,and 6) the demonstration results to include: effectiveness, implementability, and cost. Volume 2 contains the appendices to Volume 1.

14. SUBJECT TERMS
Soil Washing , Heavy Metals, Recycling, Physical Separation, Small Arms Ranges, Technology Demonstration, Acid Leaching, Lead Remediation, Implementation, Maintenance, TCLP, Bench-Scale test, Screening, Attrition Scrubbing

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APPENDIX A
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APPENDIX B
Data Archiving and Demonstration Plan

Raw data from the demonstration have been archived at the NFESC in hard copy and electronic format. The approved demonstration plan has also been archived at the NFESC. To obtain copies of either the data or the plan, contact Barbara Nelson at the NFESC (see Appendix A).

APPENDIX C

SITE CHARACTERIZATION DATA

ANALYSIS OF +10-MESH METALS FRACTION

Table C-1. Composition of +10 Mesh Metals Fraction

Product	Composition, Weight Percent			
	C-OC02-U-1L	B-NV25-U-1L	B-NV26-U-1L	AVERAGES
Loose Soil	4.80	5.00	7.20	5.67
Magnetic	6.60	5.40	4.50	5.50
Pb	52.06	50.65	44.87	49.19
Cu	27.17	25.07	28.11	26.78
Zn	1.33	1.99	2.24	1.85
Sb	0.67	2.66	2.97	2.10
Slag/Unknown	7.40	9.20	10.10	8.90
Sum	100	100	100	100

HAZEN

Hazen Research, Inc.
4601 Indiana Street • Golden, CO 80403
Tel: (303) 279-4501 • Telex 45-860
Fax: (303) 278-1528

February 6, 1997

Mr. Dan Janke
Battelle Environmental Restoration Department
505 King Avenue
Columbus, OH 43201-2623

Re: Analysis of Three Fort Polk Metals Fraction Samples
HRI Project 8939

Dear Mr. Janke:

The analyses conducted to characterize the primary metal composition of three "metals fraction" samples collected during remediation studies at the Fort Polk site have been completed by Hazen Research, Inc. This letter will confirm and supplement earlier facsimile transmittals of the preliminary data.

INTRODUCTION

Battelle Environmental Restoration Department (Battelle) has been contracted by the U. S. Department of Defense to evaluate the performance of selected vendors' applied remediation technologies at the Fort Polk small-arms range in Louisiana. As part of this effort, Battelle has requested that Hazen determine the lead, copper, zinc, and antimony content in three samples of a spent ammunition product that was concentrated at the site. The results of the analyses would be indicative of the selected elemental composition of the metals fraction recovered from the range and furnish baseline data for evaluating remediation process performance at the site.

SCOPE OF WORK

Battelle provided three metals fraction samples in two shipments for the analyses. The first, identified as "C-OC02-U-L1", collected at 2:00 p.m. on October 2, 1996, was received at Hazen on October 17, 1996, and assigned Sample Number 48697. The second and third samples, respectively identified as "B-NV25-U-1L, 11/25/96, 4:00 p.m." and "B-NV26-U-1L, 11/26/96, 4:00 p.m.", were received on January 7, 1997, and correspondingly assigned Sample Numbers 48838-1 and 48838-2. The analytical procedure employed for the first sample (C-OC02-U-L1) is described in detail below. The procedure applied to the second and third samples was simplified based upon the results of the first analysis, as discussed later in the report.

SAMPLE C-OC02-U-L1

The sample is qualitatively described as consisting principally of spent small-arms ammunition with some loose soil. The analytical procedure and results for the characterization of the sample are presented schematically in Figure 1 and discussed here.

The metals fraction feed sample was screened at 10 mesh to remove 21.9 grams of contained loose soil. The screen oversize product was directed to ferromagnetic separation, where 30.1 grams of iron/steel munitions were recovered. The soil and iron/steel components respectively represented 4.8 and 6.6 weight percent of the sample and were excluded from the subsequent melting and metals analysis.

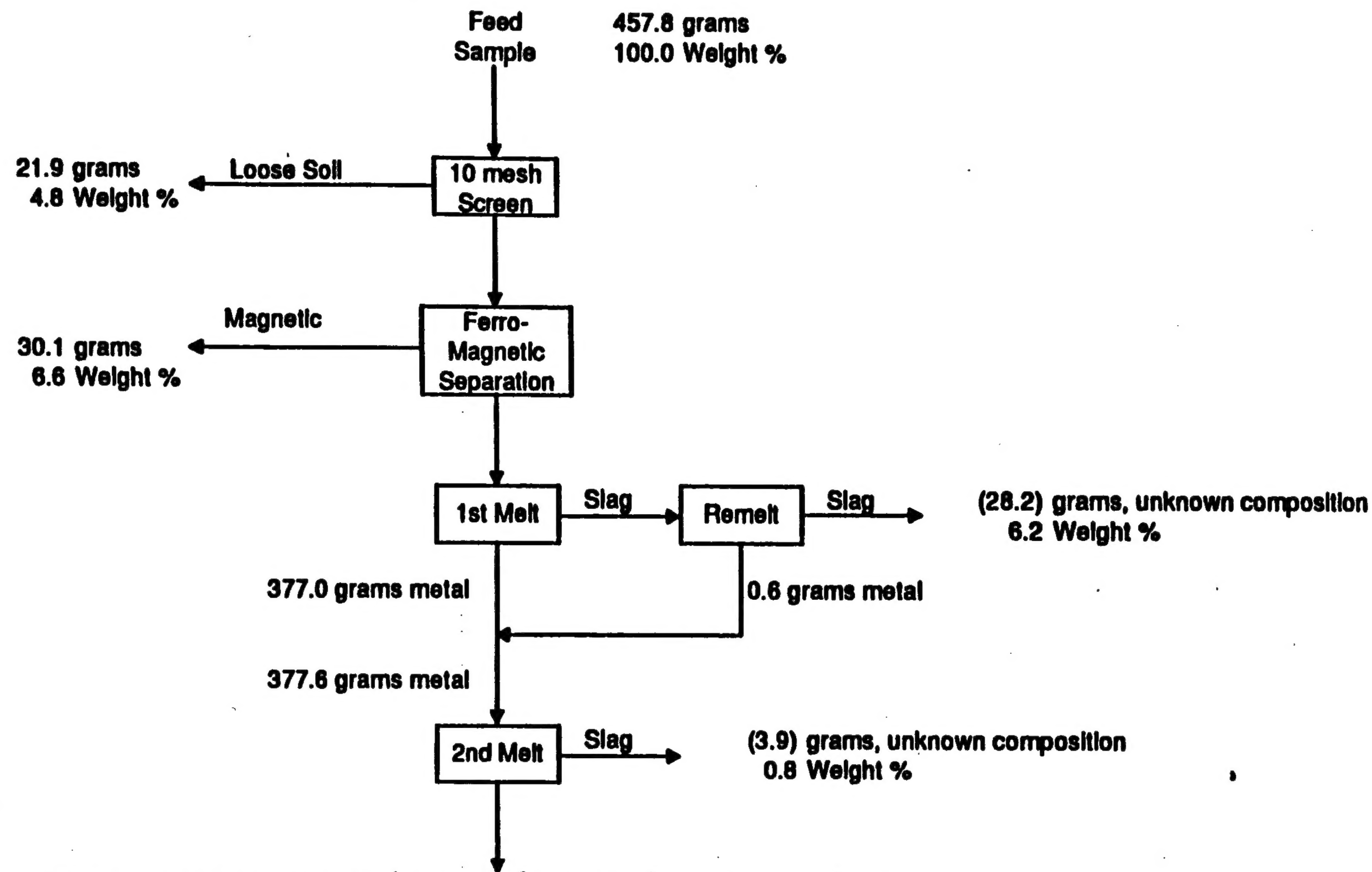
The 405.8 grams, consisting primarily of non-ferromagnetic metal with some soil included in the crevices of deformed munitions, were directed to a reducing melt in a gas-fired furnace. The sample was blended with 2.0 grams of carbon to maintain a reducing environment and 30.0 grams of borax to produce a stable slag that would minimize metal volatilization. The mix was placed in a silicon carbide crucible in a nominal 2,000°F furnace for about one hour. The molten metal was poured into a graphite mold, and the slag portion was collected and remelted to recover contained metal.

The data in Figure 1 show that the first melt resulted in 377.0 grams of metal, with an additional 0.6 gram of metal recovered by remelting the slag. Overall, the two-stage process resulted in a weight loss of 28.2 grams of material with unknown composition, a portion of which would have been the soil included in the crevices of deformed munitions referred to above. The casting from the process was unsatisfactory for sampling, as two distinct metal phases competed for the available volume in the mold. That is, the cross-sectional distribution of the two distinctly colored metallic phases was visually variable throughout the length of the bar-shaped mold and, as such, impossible to sample representatively by drilling or slicing the ingot. A second melt process was conducted as described here to overcome this sampling error.

The 377.6 grams of metal were directed to a second melt at the same conditions described earlier. The molten metal and slag were allowed to solidify in the silicon carbide crucible. Upon cooling, the slag was chipped away to produce the ingot as shown in Figures 2 and 3. The ingot was drilled and the shavings were collected, dissolved in nitric acid, and directed to atomic absorption (AA) analysis for lead, copper, and zinc and ICP analysis for antimony.

Referring to Figure 1, it can be seen that 373.7 grams of metal were recovered to the ingot. The analytical results show that the metal contained 63.8% lead, 33.3% copper, 1.63% zinc, 0.823% antimony, and 0.51% unknown elements by weight. Note that the reported metal percentage values (lead, copper, zinc, and antimony) are the average of the duplicate analyses (shown in Figure 1) that were determined in conjunction with the analysis of lead, copper, and zinc commercial

Figure 1. Analysis of Fort Polk Metals Fraction Sample C-OC02-U-L1



373.7 grams Metal @ 63.8% Pb,[1] 33.3% Cu,[2] 1.63% Zn,[3] and 0.823% Sb,[4] and 0.45% unknown components
81.6 Weight %

[1] Based upon the average of duplicate analyses: 63.4% and 64.1% Pb.
[2] Based upon the average of duplicate analyses: 32.9% and 33.7% Cu.
[3] Based upon the average of duplicate analyses: 1.63% and 1.63% Zn.
[4] Based upon the average of duplicate analyses: 0.814% and 0.832% Sb.

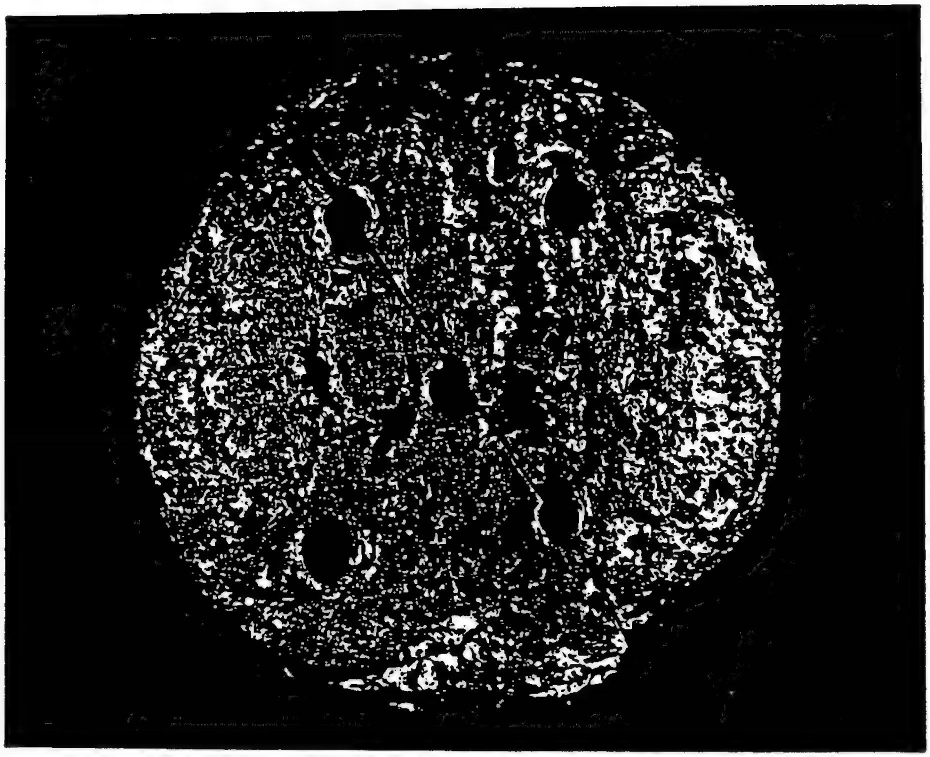


Figure 2

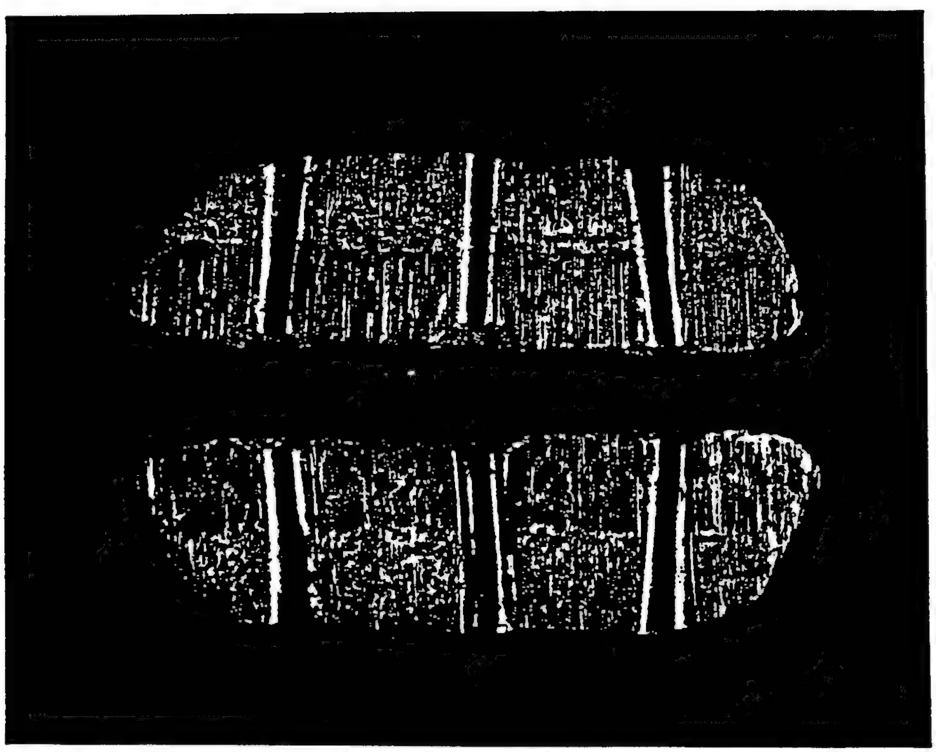


Figure 3

standards. The analyzed values for the commercial standards varied by 1, 2, and 0%, respectively, from the published values for the lead, copper, and zinc solutions. A complete mass balance for the provided metal fractions sample is presented in Table 1.

Table 1. Mass Balance for Metals Fraction Sample C-OC02-U-L1

Product	Weight, Grams	Weight, %
Feed	457.8	100.0
Loose Soil	21.9	4.8
Ferromagnetic Material	30.1	6.6
Lead	238.2	52.0
Copper	124.4	27.2
Zinc	6.1	1.3
Antimony	3.1	0.7
Slag/Unknown Composition	34.0	7.4

The data in Table 1 show that the provided metals fraction sample consisted of 52.0% lead, 27.2% copper, 1.3% zinc, and 0.7% antimony by weight. Loose soil, a ferromagnetic fraction, and unknown material comprised 4.8, 6.6, and 7.4 weight percent of the sample, respectively. Although the lead and copper metal phases are clearly defined in Figure 3, the distribution of the zinc and antimony metals in the ingot was unknown, and thus no attempt was made to correct the distribution in Table 1, based upon the somewhat nonuniform shape of the ingot.

SAMPLES B-NV25-U-1L AND B-NV26-U-1L

Each of these samples was similar to the first, consisting of spent small-arms ammunition and loose soil. The analytical procedure applied to the two samples was a simplified version of the earlier work, based upon the experience gained in treating Sample C-OC02-U-L1. The modified analytical methods and results for the characterization of the two samples are presented schematically in Figures 4 and 5 and discussed here.

Each of the samples, identified as B-NV25-U-1L and B-NV26-U-1L, with respective as-received weights of 461.7 and 478.1 grams, was wet screened at 10 mesh, and the size fractions were dried and weighed. The screen oversize was directed to ferromagnetic separation to generate magnetic

Figure 4. Analysis of Fort Polk Metals Fraction Sample B-NV25-U-1L

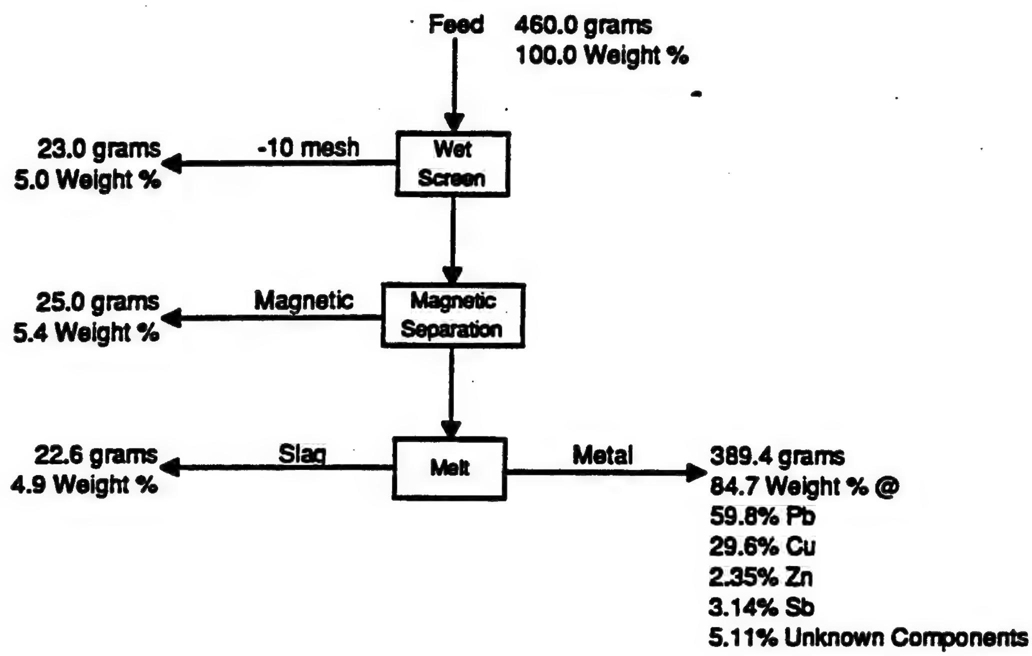
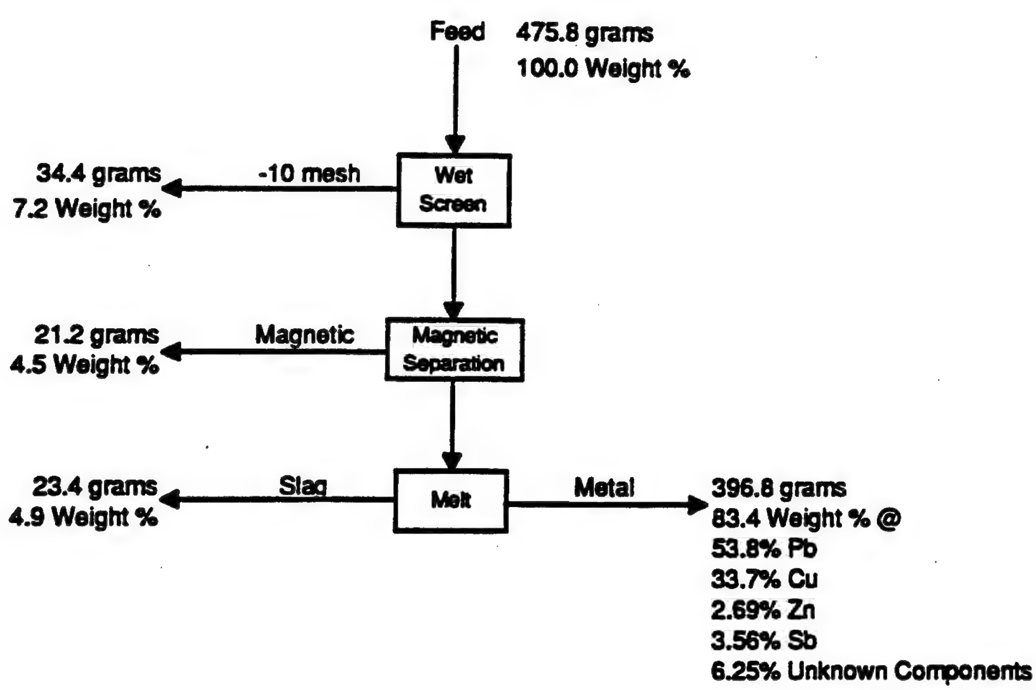


Figure 5. Analysis of Fort Polk Metals Fraction Sample B-NV26-U-1L



and nonmagnetic products. Nonmagnetic material for each sample was melted and blended with 2.0 grams of carbon to maintain a reducing environment and 30.0 grams of borax to produce a stable slag that would minimize metal volatilization. The mix was placed in a silicon carbide crucible in a 2,000°F furnace for about one hour, and the molten metal and slag were allowed to solidify in the silicon carbide crucible.

Upon cooling, the slag was chipped away from the two samples to produce ingots (not photographed) that were similar in size, shape, color, and phase composition to the first sample shown previously in Figures 2 and 3. The ingots were drilled, and the shavings were collected, dissolved in nitric acid, and directed to AA analysis for lead, copper, and zinc and ICP analysis for antimony.

With reference to Figure 4, the B-NV25-U-1L sample contained 23.0 grams of loose soil (5.0 weight percent) and 25.0 grams (5.4 weight percent) of ferromagnetic material. Melting of the nonmagnetic fraction generated 22.6 grams of slag and a 389.4-gram metal ingot representing 84.7 weight percent of the total sample. Analysis of the ingot showed that the metal was 59.8% lead, 29.6% copper, 2.35% zinc, and 3.14% antimony, and 5.11% of the material was of unknown composition.

Similarly, the B-NV26-U-1L (Figure 5) sample contained 7.2 weight percent loose soil (34.4 grams) and 4.5 weight percent (21.2 grams) ferromagnetic material. Melting of the nonmagnetic fraction generated 23.4 grams of slag and a 396.8-gram metal ingot representing 83.4 weight percent of the total sample. Analysis of the ingot showed that the metal was 53.8% lead, 33.7% copper, 2.69% zinc, and 3.56% antimony, and 6.25% of the material was of unknown composition.

Note that the reported metal percentage values (lead, copper, zinc, and antimony) for the two samples were determined in conjunction with the analysis of lead, copper, and zinc commercial standards. The analyzed values for the commercial standards varied by 3.4%, 3.7%, and 2.9%, respectively, from the published values for the lead, copper, and zinc solutions.

SUMMARY

The results of the analyses for the three metals fraction samples are summarized in Table 2.

In conclusion, the analysis of the three metals fraction samples furnishes indicative composition data for the provided materials. However, the work does not comprehensively address variations that might be seen in a given 500-gram sample of metals collected at the site; the makeup of such a sample might be influenced by location or historical composition of the small-arms ammunition used at the range.

Table 2. Mass Balance for Three Metals Fraction Samples

Product	Composition, Weight Percent		
	C-OC02-U-L1	B-NV25-U-1L	B-NV26-U-1L
Feed	100.0	100.0	100.0
Loose Soil	4.8	5.0	7.2
Ferromagnetic Material	6.6	5.4	4.5
Lead	52.0	50.6	44.9
Copper	27.2	25.1	28.1
Zinc	1.3	2.0	2.2
Antimony	0.7	2.7	3.0
Slag/Unknown Components	7.4	9.2	10.1

We appreciate the opportunity to be of service to Battelle in the remediation study of the Fort Polk facility. Please do not hesitate to call if there are any questions or if further assistance is required.

Sincerely,

Jim Seidel

James F. Seidel
Project Coordinator

JFS:wlk

HAZEN

Hazen Research, Inc.
4601 Indiana Street • Golden, CO 80403
Tel: (303) 279-4501 • Telex 45-860
Fax: (303) 278-1528

February 25, 1997

Ms. Sandy Anderson
Battelle QA Unit
505 King Avenue
Columbus, OH 43201-2623

Re: Supplemental QA Information for "Analysis of Three Fort Polk Metals Fraction Samples"
HRI Project 8939

Dear Ms. Anderson:

In response to our recent telephone conversation, this additional QA information is furnished to support the data and conclusions presented in the above-mentioned report. Included, per your request, are direct laboratory data (enclosed), operator name, model/serial numbers for the equipment used in the analyses, software identifications and version numbers used in the preparation of the report, and an accounting of the calculation procedure used for computing the lead metal mass recorded in Table 1 of the report.

The enclosed analytical data present the lead, copper, and antimony analyses for the C-OC02-U-L1 metal ingot, which is identified by the title "metal" in the analytical sheets. The zinc analysis was requested later by Mr. Dan Janke of Battelle, and is reported under the laboratory control number for this sample (J403-1) that is referenced on the associated data sheets. The metal analysis results for B-NV25-U-1L and B-NV26-U-1L are reported under the respective and previously assigned Hazen Sample Numbers 48838-1 and 4838-2.

The lead, copper, and zinc analyses were determined by atomic absorption by Ms. Pam Ware, using a Perkin Elmer AAnalyst 300, with Serial Number 041N6102104. ICP antimony analyses were conducted by Mr. Mike Remmers, using a Leeman Labs, Inc. Model PS100, with Serial Number 60705. The analytical data were reviewed by Mr. Bob Rostad before issuance. The data were compiled by the undersigned, using Excel Version 5.0, and the report was prepared using WordPerfect Version 6.1.

Finally, the procedure used to compute the lead mass of 238.2 grams in Sample C-OC02-U-L1 in Table 1 on page 5 of the report is the same as that used for all metals and is detailed here using the lead calculation as an example.

Duplicate analyses of the 373.7-gram metal ingot resulted in values of 63.4 and 64.1% lead. The average of the two numbers is 63.75%; consequently:

$$\frac{0.6375\ \textit{Gram Lead}}{1\ \textit{Gram Metal}} \times 373.7\ \textit{Grams Metal} = 238.2\ \textit{Grams Lead}$$

I hope this information satisfies the QA requirements associated with this work. Please do not hesitate to call if you have any questions or if further information is required.

Sincerely,

James F. Seidel
Project Coordinator

JFS:wlk

Enclosures

ANALYSIS WORKSHEET

TY: REGULAR
PE: NEW REQUEST
OUP: AA
AA
HCL/HNO3/HCLO4/HF
HCL
12

Calibration: Blanks:

1 00
10
10^2
10^3
10^4

LEAD
10-23-1996 # 6,634 J403/96
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 1 @ $ 9.00 EA.

ample
cription # MATX EST IDEN

AA CALCULATIONS.FACTOR= 1 PB AS PB,%

IDEN							PB,%
1	7.510	7.510	11.8546	1.0	1000	1000	63.4
R	7.600	7.600	11.8546	1.0	1000	1000	64.1
S1002	10.100	10.100	1.0000	1.0	1	100	.101

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

0.100

ENTRY NUMBER 6634
COMPLETE 10-28-1996

ial Instructions: Please ide ents:

: & SHEETS WITH JARVIS

Hazen Research Inc

ANALYSIS WORKSHEET

"Y: REGULAR
YPE: NEW REQUEST
ROUP: AA
AA
/HCL/HNO3/HCLO4/HF
N HCL
7

Calibration: Blanks:
1 00
10
10^2
10^3
10^4

COPPER
10-23-1996 # 6,635 J403/96
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 1 @ $ 9.00 EA.

AA CALCULATIONS.FACTOR= 1

Sample cription	#	MATX	EST.	IDEN							CU AS CU,%
				1	3.900	3.900	11.8546	1.0	1000	1000	32.9
				R	4.000	4.000	11.8546	1.0	1000	1000	33.7
			.050	5502	5.080	5.080	1.0000	1.0	100	1	.051

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

ENTRY NUMBER 6635
COMPLETE 10-28-1996

cial Instructions:

Please identify hazardous sample components:

E & SHEETS WITH JARVIS

ANALYSIS WORKSHEET

TY: REGULAR
PE: NEW REQUEST
OUP: ICP

HNO3/HCLO4/H2SO4/HF
H2SO4 11/6/96
1 MR

Calibration: Blanks:

Calibration		Blanks
		1
		10
		10^2
		10^3
		10^4

ANTIMONY
10-23-1996 # 6,636 J403/96
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 1 @ $ 19.00 EA.

ample :ription	#	MATX	EST	IDEN	RDG
				1	
				Bl	
				Blank	

ICP CALCULATIONS.FACTOR= 1

						SB AS SB,%
96.700	96.547	11.8546	1.0	1000	1	.814
98.800	98.647	11.8546	1.0	1000	1	.832

BLANK RDGS: .153 / .153 / .153 / .153 / .153 /

ENTRY NUMBER 6636
COMPLETE 11-06-1996

ial Instructions: Please identify hazardous sample components:

& SHEETS WITH JARVIS

Hazen Research Inc

ANALYSIS WORKSHEET

)RITY: REGULAR
"YPE: ADDITIONAL REQUEST
GROUP: AA
IE AA
T/HCL/HNO3/HCLO4/HF
3N HCL
32

Calibration: Blanks:

1 000
10
10^2
10^3
10^4

ZINC
10-29-1996 # 6,923 J403/96
~~LIQUID~~ SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 1 @ $ 9.00 EA.
TOTAL PRICE: $ 9.00

Sample scription	#	MATX.	EST.	IDEN.	AA CALCULATIONS.FACTOR= 1					ZN AS	ZN,%
-1				1	0.249	1.930	11.8546	1.0	1000	100	1.63
				R	0.250	1.938	11.8546	1.0	1000	100	1.63
			.010	STD	0.135	1.031	1.0000	1.0	100	1	.010
				D.I							

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /
CALIBRATION CURVE:

0.000	0.000
0.500	0.066
1.000	0.131
3.000	0.380
5.000	0.600

ENTRY NUMBER 6923
COMPLETE 10-30-1996

ial Instructions:

Please identify hazardous sample components:

ANALYSIS WORKSHEET

RITY: REGULAR
TYPE: NEW REQUEST
GROUP: AA
E AA
T/HCL/HNO3/HCLO4/HF
3N HCL
7

Calibration: Blanks:

Blanks
1 00
10
10^2
10^3
10^4

COPPER
01-08-1997 # 566 A119/97
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 2 @ $ 9.0: EA.
TOTAL PRICE: $ 18.0:

AA CALCULATIONS.FACTOR= 1

Sample scription	#	MATX.	EST.	IDEN.							CU AS CU,%
8-1				1	18.600	18.600	6.2850	1.0	1000	100	29.6
				2	18.400	18.400	5.4630	1.0	1000	100	33.7
			1.09	5322	2.100	2.100	0.2003	1.0	100	10	1.05

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

ENTRY NUMBER 566
COMPLETE 01-16-1997

ecial Instructions: Please id ... sample components:

2 DIGEST ENTIRE SAMPLE

ANALYSIS WORKSHEET

IORITY: REGULAR
?.TYPE: NEW REQUEST
.B GROUP: AA
LAME AA
TG T/HCL/HNO3/HCLO4/HF
X 3N HCL
ODE 12

Calibration: Blanks:

1	OD
10	
10^2	
10^3	
10^4	

LEAD
01-08-1997 # 565 A115/97
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 2 @ $ 9.00 EA.
TOTAL PRICE: $ 18.00

Sample Description	#	MATX.	EST.	IDEN.
8838-1	29			1
2	30			2
			1.19	53221
	31			

AA CALCULATIONS.FACTOR= 1

						PB AS PB,%
3.760	3.760	6.2850	1.0	1000	1000	59.8
2.940	2.940	5.4630	1.0	1000	1000	53.8
2.300	2.300	0.2003	1.0	100	10	1.15

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

ENTRY NUMBER 565
COMPLETE 01-16-1997

Special Instructions:

Please identify hazardous sample components:

REA 2 DIGEST ENTIRE SAMPLE

ANALYSIS WORKSHEET

RITY: REGULAR
TYPE: NEW REQUEST
GROUP: AA
E AA
T/HCL/HNO3/HCLO4/HF
3N HCL
32

Calibration: Blanks:

Blanks	
1	,004
10	1
10^2	1
10^3	0
10^4	0

ZINC
01-08-1997 # 567 1/19/97
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 2 @ $ 9.00 EA.
TOTAL PRICE: $ 18.00

Sample scription	#	MATX.	EST.	IDEN.	AA CALCULATIONS.FACTOR= 1						ZN AS ZN,%
8-1				1	0.187	1.477	6.2850	1.0	1000	100	2.35
				2	0.186	1.469	5.4630	1.0	1000	100	2.69
				53221	0.336	2.689	0.2003	1.0	100	10	1.34
				PR							

BLANK RDGS: .004 / .004 / .004 / 0 / 0 /
CALIBRATION CURVE:

0.000	0.000
0.500	0.065
1.000	0.128
3.000	0.375
5.000	0.600

ENTRY NUMBER 567
COMPLETE 01-16-1997

ecial Instructions: Please identify hazardous sample components:

2 DIGEST ENTIRE SAMPLE

ANALYSIS WORKSHEET

ƆRITY: REGULAR
YPE: NEW REQUEST
GROUP: ICP

T/HNO3/HCLO4/H2SO4/HF
5%H2SO4
Ǝ 1 1/22/97 [illegible]

Calibration: Blanks:
1
10
10^2
10^3
10^4

ANTIMONY
01-08-1997 # 568 A119/97
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 2 @ $ 19.00 EA.
TOTAL PRICE: $ 38.00

Sample Description	#	MATX.	EST.	IDEN.	RDG.
38-1				1	
				2	
				Blank	

ICP CALCULATIONS.FACTOR= 1

					SB AS SB,%	
19.700	19.746	6.2850	1.0	1000	10	3.1
19.400	19.446	5.4630	1.0	1000	10	3.5

BLANK RDGS: -.046 /-.046 /-.046 /-.046 /-.046 /

ENTRY NUMBER 568
COMPLETE 01-22-1997

ecial Instructions:

Please identify hazardous sample components:

A 2 DIGEST ENTIRE SAMPLE

CHARACTERIZATION OF THE LEAD CONTENT

IN A DRUM OF FORT POLK BERM SOIL

COMPOSITED DECEMBER 5 AND 6, 1996

HAZEN

Hazen Research, Inc.
4601 Indiana Street • Golden, CO 80403
Tel: (303) 279-4501
Fax: (303) 278-1528

March 21, 1997

FEDERAL EXPRESS

Mr. Dan Janke
Battelle Environmental Restoration Department
505 King Avenue
Columbus, OH 43201-2623

Re: Characterization the Lead Content in a Sample of Fort Polk Soil
HRI Project 8939

Dear Mr. Janke:

The work conducted to characterize the gravity-recoverable and total lead in a sample of soil collected from the small arms range at Fort Polk, Louisiana, has been completed by Hazen Research, Inc. The objective of the work was to develop a baseline for comparison with pilot-scale remediation data that are currently being generated at the site. This letter will confirm and supplement an earlier facsimile transmittal of the preliminary test data.

INTRODUCTION

As part of an effort to evaluate the performance of selected vendors' lead remediation technologies at the Fort Polk small arms range, Battelle Environmental Restoration Department (Battelle) engaged Hazen to establish characteristic gravity separation response data for the Fort Polk soils. The results of this study would serve as a basis for assessing gravity concentration efficiency, and for comparing the effectiveness of the applied field demonstration technologies.

SAMPLE RECEIPT AND PREPARATION

To meet the objectives of the test program, Battelle furnished a sample of typical soils that was collected during field demonstration activities at the site. An approximately 30-gallon drum of soil from the Fort Polk small arms range was received at Hazen on January 28, 1997, and assigned Sample Number 48897. The sample was held in storage unopened until the scheduled initiation of the testing during the week of February 10, 1997.

SCOPE OF WORK

In preparation for the work, the sample was removed from the drum and placed in five-gallon buckets for weighing (159.4 kilograms net) and material handling purposes. During this process, several small samples representing various levels in the drum were collected, composited, weighed, and dried overnight in an oven at 150°F. The dried sample was weighed, and a moisture content of 9.2% was determined for the material. Based upon these data, the net dry weight of the as-received sample provided for study was computed at 144.7 kilograms.

The procedures employed to characterize the gravity-recoverable lead were based upon conversations with Battelle and upon an earlier Hazen study of gravity concentrates collected at the Fort Polk site. The results of the earlier work were presented in a letter report to Mr. Dan Janke of Battelle on February 6, 1997 under the title "Analysis of Three Fort Polk Metals Fraction Samples." The test program applied conventional soil washing techniques including scrubbing, particle sizing, and gravity concentration to establish the recoverable lead contained in the soils. Details of the procedures used to characterize the lead content in the sample are presented with a summary of the results in Figure 1, and described here.

PROCESSING PROCEDURE

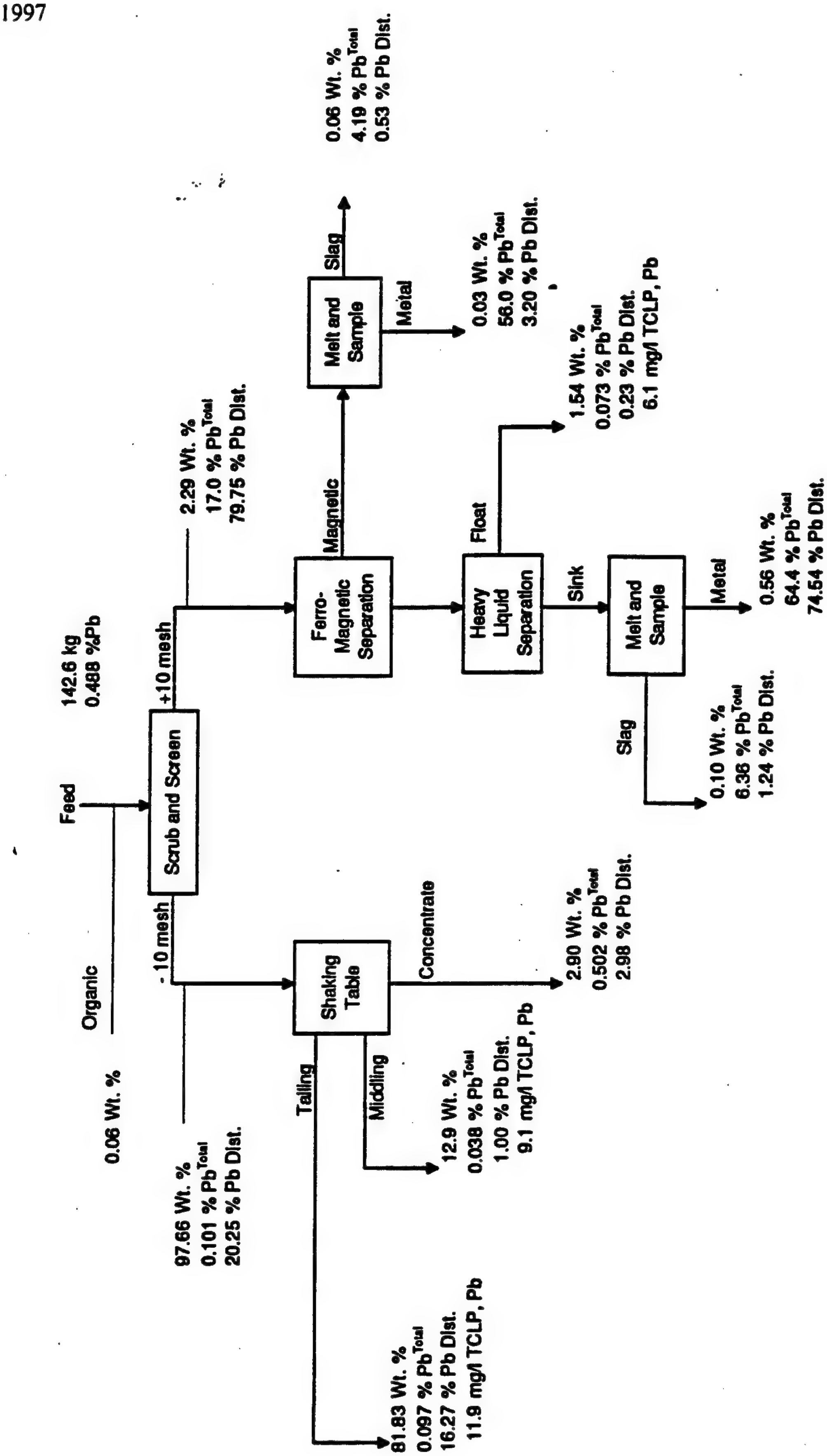
Each of the sample batches, contained in five-gallon buckets, was slurried, scrubbed with a pneumatic agitator, and screened wet at 10 mesh. Organic material was skimmed from the surface of the screen product slurries and weighed. The plus 10-mesh fraction was slurried and screened two additional times until no clay agglomerates were retained in the oversize fraction. The plus 10-mesh material was dried and treated on a magnetic separator to generate ferro- and nonmagnetic products. The nonmagnetic fraction was subjected to heavy liquid separation at a specific gravity of 2.96, resulting in float and sink products. All test products were weighed and sampled for analysis as described in the following section of the report.

The minus 10-mesh wet screen product was treated on a laboratory shaking table to produce a concentrate, middling, and tailing. The test products were dried and weighed, and the particle size distribution of each was determined (see Particle Size Analyses 1, 2, and 3 in Enclosure 1) and used to compute the overall particle size distribution for the as-received sample (see Particle Size Analysis 4 in Enclosure 1).

SAMPLING AND ANALYSIS

The ferromagnetic and heavy liquid sink products were melted, as described below, to produce metal and slag components for lead analyses. The heavy liquid float product was crushed to minus

Figure 1. Summary Data for Baseline Characterization of the Lead Content in Fort Polk Soils



⅜ inch and sampled for the Toxicity Characteristic Leaching Procedure (TCLP) lead analysis. The remainder of the material was crushed to minus 10 mesh, sampled, and subsequently pulped for Pb^{Total} analysis. The TCLP extractions and associated analyses were conducted by Evergreen Analytical, Inc. using the method described in Enclosure 2. Total lead analyses were determined at Hazen by atomic absorption analysis (AA). The analytical data include the results of all duplicate and standard correlation analyses (see Enclosure 2).

The ferromagnetic product consists primarily of miscellaneous tramp iron and one highly magnetic small arms round. This entire sample was melted in an induction furnace at a nominal 1,500°C, removed from the furnace, and allowed to cool. The slag was chipped away from the metal ingot, weighed, and pulped to furnish a sample for Pb^{Total} analysis. The metal ingot was drilled, and the chips and shavings were digested and analyzed for total lead content.

Similarly, the heavy liquid sink fraction, which was composed of nonmagnetic metal chips and whole and deformed small arms rounds, was melted to produce suitable components for analysis.

The sample was blended with 2.0 grams of carbon and 40.0 grams of borax to maintain a reducing environment and produce a stable slag that would minimize metal volatilization. The mix was placed in a silicon carbide crucible in a gas-fired furnace and held at a nominal 2,000°F for about one hour. Upon cooling, the slag was chipped away to produce an ingot, and the two products were sampled for analysis as previously described.

The entire concentrate product was dried and screened (see Particle Size Analysis 1 in Enclosure 1), and the size fractions were sampled and subsequently pulped for total lead analysis to minimize the sampling error associated with coarse free lead that might be contained in the product. Similarly, the middling product was dried, sampled for TCLP lead analysis, and screened at 14 mesh (see Particle Size Analysis 2A in Enclosure 1) to generate two size fractions for total lead analysis. The tailing product was dried and sampled for TCLP lead and total lead analyses. Finally, grab samples of the water used in the scrubbing and shaking table processing were collected, combined, and submitted for Pb^{Total} analysis to account for water-soluble lead in the sample.

CHARACTERIZATION TEST RESULTS

Referring to Figure 1 and the Computed Mass Balance for Sizing and Shaking Table Testing (Enclosure 1), it can be seen that the plus 10-mesh fraction represented 2.3 weight percent of the test feed and contained 79.7% of the total lead in the sample. The ferromagnetic fraction represented less than 0.1 weight percent of the bulk soil and contained 3.7% of the lead. The float fraction from the heavy liquid separation represented 1.5 weight percent of the feed and contained 0.23% of the total lead in the sample at a grade of 0.073% or 730 milligrams per kilogram (mg/kg). The environmentally mobile lead, defined by TCLP, analysis was determined at 6.1 milligrams per

liter (mg/l), or just slightly over the regulatory level of 5.0 mg/l. The heavy liquid sink product contained 95.0% of the total lead in the plus 10-mesh fraction, or 75.8% of the total lead identified in the sample in 0.7 weight percent of the feed material. It is noted here that there is a level of error associated with the analysis of the metal ingot produced from the heavy liquid sink fraction, as discussed at the end of this section.

The data also show that the minus 10-mesh fraction represented 97.7 weight percent of the feed and contained 20.3% of the total lead in the sample. (Note that the lead content of organic product, which included both plus and minus 10-mesh material and represented 0.06 weight percent of the feed sample, was not determined in this study.) The shaking table concentrate contained 2.98% of the lead in the sample in 2.90 weight percent of the feed at a grade of 0.502% or 5020 mg/kg. The data for Particle Size Analysis 1 (Enclosure 1) show that 82.4% of the lead in the concentrate was contained in the plus 35-mesh fraction in 0.18% of the sample at a grade of 6.61% Pb. The minus 35-mesh fraction represented 2.72 weight percent of the soil and contained 0.094% lead (940 mg/kg).

The shaking table middling product represented 12.9 weight percent of the feed and contained 1.0% of the lead in the sample at a grade of 0.038% (380 mg/kg). The data for Particle Size Analysis 2A (Enclosure 1) show that 23.8% of the lead in the product was contained in the 10- by 14-mesh size fraction, which represented 4.4 weight percent of the test product. The TCLP lead analysis of the middling indicated a lead level of 9.1 mg/kg.

The data for the shaking table tailing showed that this material comprised 81.8 weight percent of the soil sample and contained 16.3% of the total lead at a grade of 0.097% (970 mg/kg). Although not confirmed by this work, it is expected that the bulk of the lead in this product is contained in the minus 200-mesh slime/clay fraction that represented 37.5 weight percent of the sample and 32.9 weight percent of the overall feed material (see Particle Size Analyses 3 and 4 in Enclosure 1). The TCLP lead analysis showed that the gravity tailing product contained 11.9 mg/l of potentially mobile lead. The analysis of the water used in the scrubbing and shaking table processing did not identify any lead in the solution, at a detection limit of 1 mg/l.

The error associated with the analysis of the heavy liquid sink fraction occurred during the process of placing the heavy liquid sink fraction in the furnace. The crucible containing the sample was bumped and upended, and a portion of the material spilled onto the furnace lining (refractory brick) below the hearth and was unrecoverable in the hot environment. The melt continued. At the completion, the furnace was dismantled, and the brick below the hearth was removed. The brick (1,175 grams) was crushed, pulped for duplicate AA analysis, and found to contain 6.84% lead (the average of duplicate analyses of 6.82% and 6.85% lead). Based upon these analyses, a total of 80.3 grams of lead was contained in the brick. When this amount of metal was added to the 725 grams of lead in the ingot, a grade of 64.4% lead was computed for the 805.3-gram sample. These data are used to examine the possible error range resulting from the furnace accident:

- The weight of the metal ingot after melting was 725.0 grams, with an analysis of 60.5% lead; hence the ingot contained 438.6 grams lead.

- The weight of the recovered furnace brick was 1,175 grams at 6.84% lead; thus the brick contained 80.3 grams of lead.

- Using the ingot as the basis for computing the total lead contained in the bulk soil, a value of 0.432% is calculated. The addition of the lead recovered in the refractory brick to the metal ingot results in a computed lead grade for the sample of 0.488%, or an overall increase of 11.5%.

- Based upon the judgement of the furnace operator, all of the brick containing lead from the melt was successfully recovered. Therefore, for the purposes of formal reporting, the total lead recovered to the ingot and the refractory brick was used to compute the mass balance and lead distribution for the provided sample of Fort Polk soils. For reference, the solids mass and lead distribution were computed based upon the actual lead recovered to the ingot; the data are included in Enclosure 1 as Supplementary Mass Balance for Sizing and Shaking Table Testing.

CONCLUSIONS

The characterization of the gravity-recoverable lead in the Fort Polk soils was conducted under controlled laboratory conditions, and as such presents a baseline set of optimum results. It is clear, however, that the bulk of the lead contamination in the sample (79.7%) is contained in the plus 10-mesh fraction, and should be readily recoverable using a range of gravity separation techniques. The minus 10-mesh fraction contains comparatively little lead that responds well to gravity separation, with the bulk of the contaminant in this product (80.3%) reporting to the gravity tailing. It is noted that the mode of occurrence of the lead (e.g. very fine particulate, or mineral adsorbed on fine particles) in the gravity tailing was not determined as a part of this study. The results of the TCLP lead analyses, conducted on materials representing 96.4 weight percent of the feed, indicated low levels of potentially mobile lead. However, all of the analyzed values exceeded the 5 mg/l regulatory limit.

We appreciate the opportunity to be of service to Battelle in the characterization study. Please do not hesitate to call to discuss any aspect of this report.

Sincerely,

James F. Seidel /lh

James F. Seidel
Project Coordinator

JFS:wlk
Enclosures

ENCLOSURE 1

Characterization Test Data

Attachment **Project No.:** 8939
Computed Mass Balance for Sizing and Shaking Table Testing **Date:** Mar-97

Purpose: The charactrize the the lead content and distribution in the provided sample.

Sample: Client provided and identified "Fort Polk Bulk Soil Sample" (Hazen Sample 48897)

Procedure: The approximately 145 kg (dry)sample was slurried, scrubbed with a pneumatic agitator, and screened at 10 mesh. Organic material was skimmed from the surface of the screened product slurries, and this product was dried and weighed. The plus 10 mesh fraction was slurried and screened two additional times to disaggregate the contained clay prior to subsequent processing. The clean plus 10 mesh fraction was dried and directed to magnetic separation to remove ferro-magnetic material. The non-magnetic fraction was subjected to heavy liquid separation at a specific gravity of 2.96 generating float and sink products. The ferro-magnetic and heavy liquid sink products were each melted to generate metal and slag products that were sampled for total Pb analysis. The heavy liquid float fraction was crushed to minus 3/8-inch and sampled for TCLP Pb analysis, and the remainder of the sample was crushed to minus 10-mesh, sampled and pulped for total Pb analysis. The minus 10 mesh scrubbed product was treated on a shaking table to generate concentrate, middling and tailing products that were sampled for total Pb and TCLP pb analysis as indicated in the results. A grab sample of the process water from the shaking table processing was collected and also submitted for Pb analysis.

Results:

Product	Weight (grams)	Weight %	Analysis Pb^{Total} %	Analysis TCLP, Pb mg/l	% Distribution Pb^{Total}
Feed (analyzed)[1]	144700				
Feed (computed)	142607	100.00	0.488		100.00
Organic material	79.9	0.06	ND		
+10 mesh	(3263.3)	(2.29)	(17.0)		(79.75)
Ferro-magnetic fraction	(127.6)	(0.09)	(20.4)		(3.73)
Metal	39.8	0.03	56.0		3.20
Slag	87.8	0.06	4.19		0.53
Non-magnetic fraction	(3135.7)	(2.20)	(16.9)		(76.01)
Heavy Liquid Float	2194.7	1.54	0.073	6.1	0.23
Heavy Liquid Sink	(941.0)	(0.66)	(56.0)		(75.78)
Metal	805.3	0.56	64.4		74.54
Slag	135.7	0.10	6.36		1.24
-10 mesh	(139264)	(97.66)	(0.101)		(20.25)
Shaking Table Concentrate	(4133.0)	(2.90)	(0.502)		(2.98)
+35 mesh	258.6	0.18	6.61		2.46
- 35 mesh	3874.4	2.72	0.094		0.52
Shaking Table Middling	(18431)	(12.92)	(0.038)	9.1	(1.00)
+14 mesh	90.6	0.06	1.83		0.24
-14 mesh	18340	12.86	0.029		0.76
Shaking Table Tailing	116700	81.83	0.097	11.9	16.27
Process Water			<1 mg/l		

ND Not Determined
Note: When applicable, the Pb analyses are the average of duplicate analyses. See Enclosure 2.

Attachment
Particle Size Analysis 1

Project 8939
Date Mar-97

Purpose: To determine the lead distribution as a function of particle size for the sample.

Sample: Shaking Table Test 1 concentrate for client provided and identified "Bulk Fort Polk Soil Sample" (Hazen Sample 48897)

Procedure: The entire sample of concentrate was dry screened and the fractions collected, sampled and pulped for Pb analysis as indicated in the results.

Results:

Product		Weight	Weight	Analysis Pb	% Distribution
mesh	microns	grams	%	%	Pb
Feed (analyzed)		4143			
Feed (computed)		4132.9	100.0	0.502	100.0
14 (1)	1190	23.9	0.6	36.0	41.4
20 (2)	841	20.0	0.5	20.8	20.1
28 (3)	595	63.1	1.5	4.52	13.7
35	425	151.6	3.7	0.985	7.2
48	297	23.4	0.6	0.532	0.6
65	210	1269.1	30.7	0.146	8.9
100	149	983.8	23.8	0.054	2.6
150	105	991.2	24.0	0.059	2.8
200	74	181.3	4.4	0.060	0.5
-200	-74	425.6	10.3	0.106	2.2

(1) Average of duplicate analyses: 32.0 and 39.9% Pb
(2) Average of duplicate analyses: 20.7 and 20.9% Pb
(3) Average of duplicate analyses: 4.52 and 4.52% Pb

Note: AA analysis of 1.16% Pb was recorded for the 1.19% Pb standard for this analytical series.

Attachment
Particle Size Analysis 2A

Project 8939
Date Mar-97

Purpose: To determine the lead distribution as a function of particle size for the sample.

Sample: Shaking Table Test 1 middling for client provided and identified "Bulk Fort Polk Soil Sample" (Hazen Sample 48897)

Procedure: A representative portion of the middling sample was dry screened at 14 mesh and the fractions collected, sampled and pulped for Pb analysis as indicated in the results.

Results:

Product		Weight	Weight	Analysis Pb	% Distribution
mesh	microns	grams	%	%	Pb
Feed (computed)		895.3	100.0	0.038	100.0
14 (1)	1190	4.40	0.5	1.83	23.8
-14	-1190	890.9	99.5	0.029	76.2

(1) Average of duplicate analyses: 1.81 and 1.85% Pb

Note: AA analysis of 1.16% Pb was recorded for the 1.19% Pb standard for this analytical series.

Attachment
Particle Size Analysis 2

Project 8939
Date Mar-97

Purpose: To determine the particle size distribution of the sample.

Sample: Shaking Table Test 1 middling for client provided and identified "Bulk Fort Polk Soil Sample" (Hazen Sample 48897)

Procedure: A representative portion of the middling sample was dry screened at the sizes indicated in the results.

Results:

Product		Weight	Weight		
			Retained	Cumulative Weight %	
mesh	microns	grams	%	Passing	Retained
Feed (computed)		895.3	100.0		
14	1190	4.40	0.5	99.5	0.5
20	841	5.50	0.6	98.9	1.1
28	595	10.7	1.2	97.7	2.3
35	425	17.2	1.9	95.8	4.2
48	297	30.4	3.4	92.4	7.6
65	210	122.1	13.6	78.7	21.3
100	149	210.8	23.5	55.2	44.8
150	105	271.5	30.3	24.9	75.1
200	74	92.2	10.3	14.6	85.4
-200	-74	130.5	14.6		

Attachment
Particle Size Analysis 3

Project 8939
Date Mar-97

Purpose: To determine the particle size distribution of the sample.

Sample: Shaking Table Test 1 tailing for client provided and identified "Bulk Fort Polk Soil Sample" (Hazen Sample 48897)

Procedure: A representative portion of the tailing sample was dry screened at the sizes indicated in the results.

Results:

Product		Weight	Weight		
			Retained	Cumulative Weight %	
mesh	microns	grams	%	Passing	Retained
Feed (computed)		1342.0	100.0		
14	1190	1.2	0.1	99.9	0.1
20	841	2.3	0.2	99.7	0.3
28	595	7.5	0.6	99.2	0.8
35	425	19.8	1.5	97.7	2.3
48	297	67.7	5.0	92.7	7.3
65	210	210.6	15.7	77.0	23.0
100	149	248.3	18.5	58.5	41.5
150	105	180.7	13.5	45.0	55.0
200	74	100.1	7.5	37.5	62.5
-200	-74	503.8	37.5		

Attachment
Particle Size Analysis 4

Project 8939
Date Mar-97

Purpose: To compute the particle size distribution of the sample, based upon analysis of the process product streams. (See Particle Size Analyses 1,2 and 3)

Sample: Client provided and identified "Bulk Fort Polk Soil Sample" (Hazen Sample 48897)

Procedure: The particle size distribution of the as received sample of soil was computed based upon the results of Particle Size Analyses 1,2 and 3, and the analyzed weights of the plus 10 mesh component and the test products from Shaking Table Test 1.

Results:

Product		Weight	Weight		
			Retained	Cumulative Weight %	
mesh	microns	kg	%	Passing	Retained
Feed (analyzed)		144.7			
Feed (computed)		142.5	100.0		
Organic Matter		0.080	0.1	99.9	0.1
10	1680	3.13	2.2	97.7	2.3
14	1190	0.218	0.2	97.6	2.4
20	841	0.333	0.2	97.4	2.6
28	595	0.936	0.7	96.7	3.3
35	425	2.23	1.6	95.1	4.9
48	297	6.54	4.6	90.6	9.4
65	210	22.1	15.5	75.0	25.0
100	149	26.9	18.9	56.2	43.8
150	105	22.3	15.6	40.5	59.5
200	74	10.8	7.6	32.9	67.1
-200	-74	46.9	32.9		

Attachment
Supplementary Mass Balance for Sizing and Shaking Table Testing

Project No.: 8939
Date: Mar-97

Purpose: The charactrize the the lead content and distribution in the provided sample.

Sample: Client provided and identified "Fort Polk Bulk Soil Sample" (Hazen Sample 48897)

Procedure: The approximately 145 kg (dry)sample was slurried, scrubbed with a pneumatic agitator, and screened at 10 mesh. Organic material was skimmed from the surface of the screened product slurries, and this product was dried and weighed. The plus 10 mesh fraction was slurried and screened two additional times to disaggregate the contained clay prior to subsequent processing. The clean plus 10 mesh fraction was dried and directed to magnetic separation to remove ferro-magnetic material. The non-magnetic fraction was subjected to heavy liquid separation at a specific gravity of 2.96 generating float and sink products. The ferro-magnetic and heavy liquid sink products were each melted to generate metal and slag products that were sampled for total Pb analysis. The heavy liquid float fraction was crushed to minus 3/8-inch and sampled for TCLP Pb analysis, and the remainder of the sample was crushed to minus 10-mesh, sampled and pulped for total Pb analysis. The minus 10 mesh scrubbed product was treated on a shaking table to generate concentrate, middling and tailing products that were sampled for total Pb and TCLP pb analysis as indicated in the results. A grab sample of the process water from the shaking table processing was collected and also submitted for Pb analysis.

Results:

Product	Weight (grams)	Weight %	Analysis: Pb Total %	Analysis: TCLP, Pb mg/l	% Distribution Pb Total
Feed (analyzed)[1]	144700				
Feed (computed)	142527	100.00	0.432		100.00
Organic material	79.9	0.06	ND		
+10 mesh	(3183.0)	(2.23)	(14.9)		(77.11)
Ferro-magnetic fraction	(127.6)	(0.09)	(20.4)		(4.22)
Metal	39.8	0.03	56.0		3.62
Slag	87.8	0.06	4.19		0.60
Non-magnetic fraction	(3055.4)	(2.14)	(14.7)		(72.90)
Heavy Liquid Float	2194.7	1.54	0.073	6.1	0.26
Heavy Liquid Sink	(860.7)	(0.60)	(52.0)		(72.64)
Metal	725.0	0.51	60.5		71.24
Slag	135.7	0.10	6.36		1.40
-10 mesh	(139264)	(97.71)	(0.101)		(22.89)
Shaking Table Concentrate	(4133.0)	(2.90)	(0.502)		(3.37)
+35 mesh	258.6	0.18	6.61		2.78
- 35 mesh	3874.4	2.72	0.094		0.59
Shaking Table Middling	(18431)	(12.93)	(0.038)	9.1	(1.13)
+14 mesh	90.6	0.06	1.83		0.27
-14 mesh	18340	12.87	0.029		0.86
Shaking Table Tailing	116700	81.88	0.097	11.9	18.38
Process Water			<1 mg/l		

ND Not Determined
Note: When applicable, the Pb analyses are the average of duplicate analyses. See Enclosure 2.

ENCLOSURE 2

Laboratory Analytical Reports

ANALYSIS WORKSHEET

PRIORITY: REGULAR
REQ.TYPE: NEW REQUEST
LAB GROUP: AA
FLAME AA
DIG T/HCL/HNO3/HCLO4/HF
MTX 3N HCL
CODE 12

Calibration:		Blanks:
		1
		10
		10^2
		10^3
		10^4

LEAD
02-20-1997 # 3,305 B410/97
METALIC
FOR SEIDEL
PROJECT 8939
PRICE: 2 @ $ 9.00 EA.
TOTAL PRICE: $ 18.00

AA CALCULATIONS.FACTOR= 1 — PB AS PB,%

Sample Description	#	MATX.	EST.	IDEN							
MAG METAL				1	7.110	7.1100	1.2700	1.0	1000	100	56.
NON MAG METAL				2	5.890	5.8900	9.7420	1.0	1000	1000	60.
			1,19	532	2.170	2.1700	0.1866	1.0	100	10	1.1

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

ENTRY NUMBER 330[illegible]
COMPLETE 0[illegible]-26-19[illegible]

Special Instructions:

Please identify hazardous sample components:

AREA 2

Hazen Research, Inc.

ANALYSIS WORKSHEET

PRIORITY: REGULAR	Calibration:	Blanks:	LEAD
REQ.TYPE: NEW REQUEST		1 ∅	02-20-1997 # 3,303 8409/97
LAB GROUP: AA		10	SOLID
FLAME AA		10^2	FOR SEIDEL
DIG T/HCL/HNO3/HCLO4/HF		10^3	PROJECT 8939
MTX 3N HCL		10^4	PRICE: 2 @ $ 9.00 EA.
CODE 12			TOTAL PRICE: $ 18.00

BW

AA CALCULATIONS.FACTOR= 1

Sample Description	#	MATX.	EST.	IDEN							PB AS PB,%
MAG SLAG	17			1	2.170	2.1700	0.5173	1.0	100	100	4.1
NON MAG SLAG	18			2	3.340	3.3400	0.5292	1.0	100	100	6.3
	19			R 2	3.300	3.3000	0.5156	1.0	100	100	6.4
			1.14	532	2.170	2.1700	0.1866	1.0	100	10	1.1
				(J/							

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

BW

ENTRY NUMBER 3303
COMPLETE 02-20-1997

Special Instructions:

Please identify hazardous sample components:

AREA 1

Hazen Research, Inc.

ANALYSIS WORKSHEET

PRIORITY: REGULAR
REQ.TYPE: NEW REQUEST
LAB GROUP: AA
FLAME AA
DIG T/HCL/HNO3/HCLO4/HF
MTX 3N HCL
CODE 12

Calibration: Blanks:

Blanks
1 00
10
10^2
10^3
10^4

LEAD
02-21-1997 # 3,403 B439/97
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 1 @ $ 9.00 EA.
TOTAL PRICE: $ 9.00

Sample Description	#	MATX.	EST.	IDEN
2.96 FLOAT	23			1
	24			R
			1.19	S32
				Ck

AA CALCULATIONS.FACTOR= 1

						PB AS PB,%
3.600	3.6000	0.5087	1.0	100	1	.07
3.910	3.9100	0.5279	1.0	100	1	.07
2.170	2.1700	0.1866	1.0	100	10	1.1

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

ENTRY NUMBER
COMPLETE 02-

Special Instructions: Please identify hazardous sample components:

AREA 1

ANALYSIS WORKSHEET

PRIORITY: REGULAR
REQ.TYPE: NEW REQUEST
LAB GROUP: AA
FLAME AA
DIG T/HCL/HNO3/HCLO4/HF
MTX 3N HCL
CODE 12

Calibration:		Blanks:
		1
		10
		10^2
		10^3
		10^4

LEAD
02-20-1997 # 3,311 B414/97
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 2 @ $ 9.00 EA.
TOTAL PRICE: $ 18.00

AA CALCULATIONS.FACTOR= 1

Sample Description	#	MATX.	EST.	IDEN							PB AS PB,%
TT-1 TAILS	20			1	5.290	5.2900	0.5429	1.0	100	1	.09
BRICK	21			2	3.560	3.5600	0.5222	1.0	100	100	6.8
	22			[illegible]	4.110	4.1100	0.6004	1.0	100	100	6.8
			1.19	[illegible]	2.170	2.1700	0.1866	1.0	100	10	1.1

BLANK RDGS: 0 / 0 / 0 / 0 / 0 /

ENTRY NUMBER 3311
COMPLETE 02-2? 199?

Special Instructions:

Please identify hazardous sample components:

AREA 1

29.

ANALYSIS WORKSHEET

PRIORITY: REGULAR
REQ.TYPE: NEW REQUEST
LAB GROUP: AA
FLAME AA
DIG T/HCL/HNO3/HCLO4/HF
MTX 3N HCL
CODE 12

Calibration:

Blanks:
1 OD
10
10^2
10^3
10^4

LEAD
02-19-1997 # 3,160 8357/97
SOLID
FOR ANDERSON
PROJECT 8939
PRICE: ~~12~~ 16 @ $ 9.00 EA.
TOTAL PRICE: $ 108.00

AA CALCULATIONS.FACTOR= 1 PB AS PB,%

Sample Description	#	MATX.	EST.	IDE							PB AS PB,%
+14	1			1	16.700	16.7000	0.5217	1.0	100	100	32.0
+20	2			2	10.800	10.8000	0.5224	1.0	100	100	20.7
20X28	3			3	2.420	2.4200	0.5352	1.0	100	100	4.52
28X35 TT1	4			4	5.410	5.4100	0.5490	1.0	100	10	.985
35X48 CONC	5			5	2.870	2.8700	0.5394	1.0	100	10	.532
48X65	6			6	7.580	7.5800	0.5197	1.0	100	1	.14
65X100	7			7	2.880	2.8800	0.5343	1.0	100	1	.054
100X150	8			8	3.000	3.0000	0.5115	1.0	100	1	.05
150X200	9			9	3.150	3.1500	0.5277	1.0	100	1	.06
-200	10			10	5.550	5.5500	0.5255	1.0	100	1	.10
TT1 MID +14	11			11	9.390	9.3900	0.5178	1.0	100	10	1.8
TT1 MID -14	12			12	1.460	1.4600	0.5064	1.0	100	1	.02
	13			R	2.370	2.3700	0.5933	1.0	100	1000	39.
	14			R	10.900	10.9000	0.5216	1.0	100	100	20.
	15			R	2.530	2.5300	0.5600	1.0	100	100	4.5
	16			R	9.620	9.6200	0.5200	1.0	100	10	1.8
			1.19	S22	2.170	2.1700	0.1866	1.0	100	10	1.1
				C	BLANK RDGS:	0 / 0 / 0 / 0 / 0 /					

ENTRY NUMBER 3160
COMPLETE 02-?-1997

Special Instructions: Please identi... ...uous sample components:

ANALYSIS WORKSHEET

PRIORITY: REGULAR
REQ.TYPE: NEW REQUEST
LAB GROUP: AA
FLAME AA
DIG T/HCL/HNO3/HCLO4/HF
MTX 3N HCL
CODE 12

Calibration:

Blanks:
1 00
10
10^2
10^3
10^4

LEAD
02-13-1997 # 2,784 B269/97
LIQUID
FOR SEIDEL
PROJECT 8939
PRICE: 1 @ $ 9.00 EA.
TOTAL PRICE: $ 9.00

Sample Description	#	MATX.	EST.	IDEN.	AA CALCULATIONS.FACTOR= 1					PB AS	PB,G/L
TT-1 DECANT ✓				1	0.070	0.070	1.0000	1.0	1	10	<.001
				R	0.070	0.070	1.0000	1.0	1	10	<.001
				S 1000	10.000	10.000	1.0000	1.0	1	100	1.00
				D.I	BLANK RDGS: 0 / 0 / 0 / 0 / 0 /						

ENTRY NUMBER 2,784
COMPLETE 02-17-1997

Special Instructions:

..entify hazardous sample components:

AREA 2

ANALYSIS WORKSHEET

PRIORITY: REGULAR
REQ.TYPE: NEW REQUEST
LAB GROUP: SOS

DIG
MTX
REF:

Calibration:

Blanks:
1
10
10^2
10^3
10^4

TCLP EXT. W/Pb ONLY
02-21-1997 # 3,429 B450/97
SOLID
FOR SEIDEL
PROJECT 8939
PRICE: 3 @ $ ~~172.00~~ 90.00 EA.
TOTAL PRICE: $ ~~516.00~~ 270.00

Factor:

Sample Description	#	MATX.	EST.	IDEN.	RDG.	PPM	WT.	ALIQ.	DIL.1	DIL.2	Result
TT-1 MID				1							
TT-1 TAIL				2							
2.96 FLOAT				3							

Special Instructions:

Please identify hazardous sample components:

EVERGREEN ANALYTICAL, INC.
4036 Youngfield St. Wheat Ridge, CO 80033
(303) 425-6021

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) SUMMARY REPORT

Client Sample #	: B450-1		
Lab Sample #	: 01A		
Spiked Sample #	: 01A	Client	: Hazen Research, Inc.
Date Sampled	: Not Specified	Lab Work Order	: 97-0588
Date Received	: 2/24/97	Method	: 40 CFR 261.24
Date Prepared	: 3/3-5/97	Matrix	: Solid
Date Analyzed	: 3/5/97		

Element	Spike Recovery %	As Analyzed Value** mg/L	Regulatory Levels*** mg/L
Lead	22 (1)	9.1	5.0

Post-it® Fax Note 7671	Date 3/7	# of pages ▶ 3
To Bob R...	From Carl Smith	
Co./Dept. Hazen	Co.	
Phone #	Phone #	
Fax #	Fax #	

(1) Poor spike recovery due to large sample concentration.
Note: Results are reported on the leachate from the TCLP extraction.
* = Spikes are performed once for each similar matrix (water, soil, etc.) and extraction set.
** = Not corrected for Spike Recovery per Federal Register, Vol. 57, No. 227, Nov. 24, 1992. Method blank values have not been subtracted.
*** = 40 CFR 261.24 (7-1-94 Edition), Table 1-Maximum Concentration of Contaminants for the Toxicity Characteristics.

JMC
Analyst

DC
Approved

EVERGREEN ANALYTICAL, INC.
4036 Youngfield St. Wheat Ridge, CO 80033
(303) 425-6021

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) SUMMARY REPORT

Client Sample # : B450-2
Lab Sample # : 02A
Spiked Sample # : 01A
Date Sampled : Not Specified
Date Received : 2/24/97
Date Prepared : 3/3-5/97
Date Analyzed : 3/5/97

Client : Hazen Research, Inc.
Lab Work Order : 97-0588
Method : 40 CFR 261.24
Matrix : Solid

Element	Spike Recovery %	As Analyzed Value** mg/L	Regulatory Levels*** mg/L
Lead	22 (1)	11.9	5.0

(1) Poor spike recovery due to large sample concentration.
Note: Results are reported on the leachate from the TCLP extraction.
* = Spikes are performed once for each similar matrix (water, soil, etc.) and extraction set.
** = Not corrected for Spike Recovery per Federal Register, Vol. 57, No. 227, Nov. 24, 1992. Method blank values have not been subtracted.
*** = 40 CFR 261.24 (7-1-94 Edition), Table 1-Maximum Concentration of Contaminants for the Toxicity Characteristics.

GMC
Analyst

Approved

EVERGREEN ANALYTICAL, INC.
4036 Youngfield St. Wheat Ridge, CO 80033
(303) 425-6021

TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) SUMMARY REPORT

Client Sample # . : B450-3
Lab Sample # . : 03A
Spiked Sample #: : 01A
Date Sampled : Not Specified
Date Received : 2/24/97
Date Prepared : 3/3-5/97
Date Analyzed . : 3/5/97

Client : Hazen Research, Inc.
Lab Work Order : 97-0588
Method : 40 CFR 261.24
Matrix : Solid

Element	Spike Recovery %	As Analyzed Value** mg/L	Regulatory Levels*** mg/L
Lead	22 (1)	6.1	5.0

(1) Poor spike recovery due to large sample concentration.
Note: Results are reported on the leachate from the TCLP extraction.
* = Spikes are performed once for each similar matrix (water, soil, etc.) and extraction set.
** = Not corrected for Spike Recovery per Federal Register, Vol. 57, No. 227, Nov. 24, 1992. Method blank values have not been subtracted.
*** = 40 CFR 261.24 (7-1-94 Edition), Table 1-Maximum Concentration of Contaminants for the Toxicity Characteristics.

M.C.
Analyst

Approved

CHARACTERIZATION OF FORT POLK BERM SOIL

FROM RAW SOIL STOCKPILE

NOVEMBER 14, 1996

DLZ Laboratories, Inc.

ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: SL13287-1
Report Date: 12/19/96
DLZ Project Number: 9582-62

MR. JERRY TOMPKINS
BATTELLE MEMORIAL INSTITUTE
505 KING AVENUE
COLUMBUS, OHIO 43201

Job Name: FORT POLK G337318

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
B-NV14-U-1X	Solid	CLIENT	14 NOV 96/10:00	18 NOV 96

CONSTITUENT	RESULT	*PQL	UNITS	METHOD	ANALYZED	BY
Cation-Exchange	580	0.5	eq/100g	9081	12-17-96	BDY
Percent Solids	92		Percent	2540G	12-03-96	BTL
Total Organic Carbon	3260	50	mg/Kg	9060	12-03-96	SUB

* Practical Quantitation Limit

AIHA ACCREDITED LABORATORY

6121 Huntley Road • Columbus, Ohio 43229-1003 • Telephone (614) 848-4333 • FAX (614) 841-0818
With Additional Laboratory Facilities in Lansing, Michigan

DLZ Laboratories, Inc.

ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: SL13287-2
Report Date: 12/19/96
DLZ Project Number: 9582-62

MR. JERRY TOMPKINS
BATTELLE MEMORIAL INSTITUTE
505 KING AVENUE
COLUMBUS, OHIO 43201

Job Name: FORT POLK G337318

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
B-NV14-U-2X	Solid	CLIENT	14 NOV 96/10:00	18 NOV 96

CONSTITUENT	RESULT	*PQL	UNITS	METHOD	ANALYZED	BY
Cation-Exchange	6700	0.5	eq/100g	9081	12-17-96	BDY
Percent Solids	92		Percent	2540G	12-03-96	BTL
Total Organic Carbon	2530	50	mg/Kg	9060	12-03-96	SUB

* Practical Quantitation Limit

DLZ Laboratories, Inc.

ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: SL13287-3
Report Date: 12/19/96
DLZ Project Number: 9582-62

MR. JERRY TOMPKINS
BATTELLE MEMORIAL INSTITUTE
505 KING AVENUE
COLUMBUS, OHIO 43201

Job Name: FORT POLK G337318

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE/TIME	RECEIVED
B-NV14-U-3X	Solid	CLIENT	14 NOV 96/10:00	18 NOV 96

CONSTITUENT	RESULT	*PQL	UNITS	METHOD	ANALYZED	BY
Cation-Exchange	7600	0.5	eq/100g	9081	12-17-96	BDY
Percent Solids	92		Percent	2540G	12-03-96	BTL
Total Organic Carbon	1920	50	mg/Kg	9060	12-03-96	SUB

* Practical Quantitation Limit

DLZ Laboratories, Inc.

ENVIRONMENTAL TESTING • COMPLIANCE ANALYSES
INDUSTRIAL HYGIENE

Lab Number: SL13287
Report Date: 12/19/96
DLZ Project Number: 9582-62

MR. JERRY TOMPKINS
BATTELLE MEMORIAL INSTITUTE
505 KING AVENUE
COLUMBUS, OHIO 43201

Job Name: FORT POLK G337318

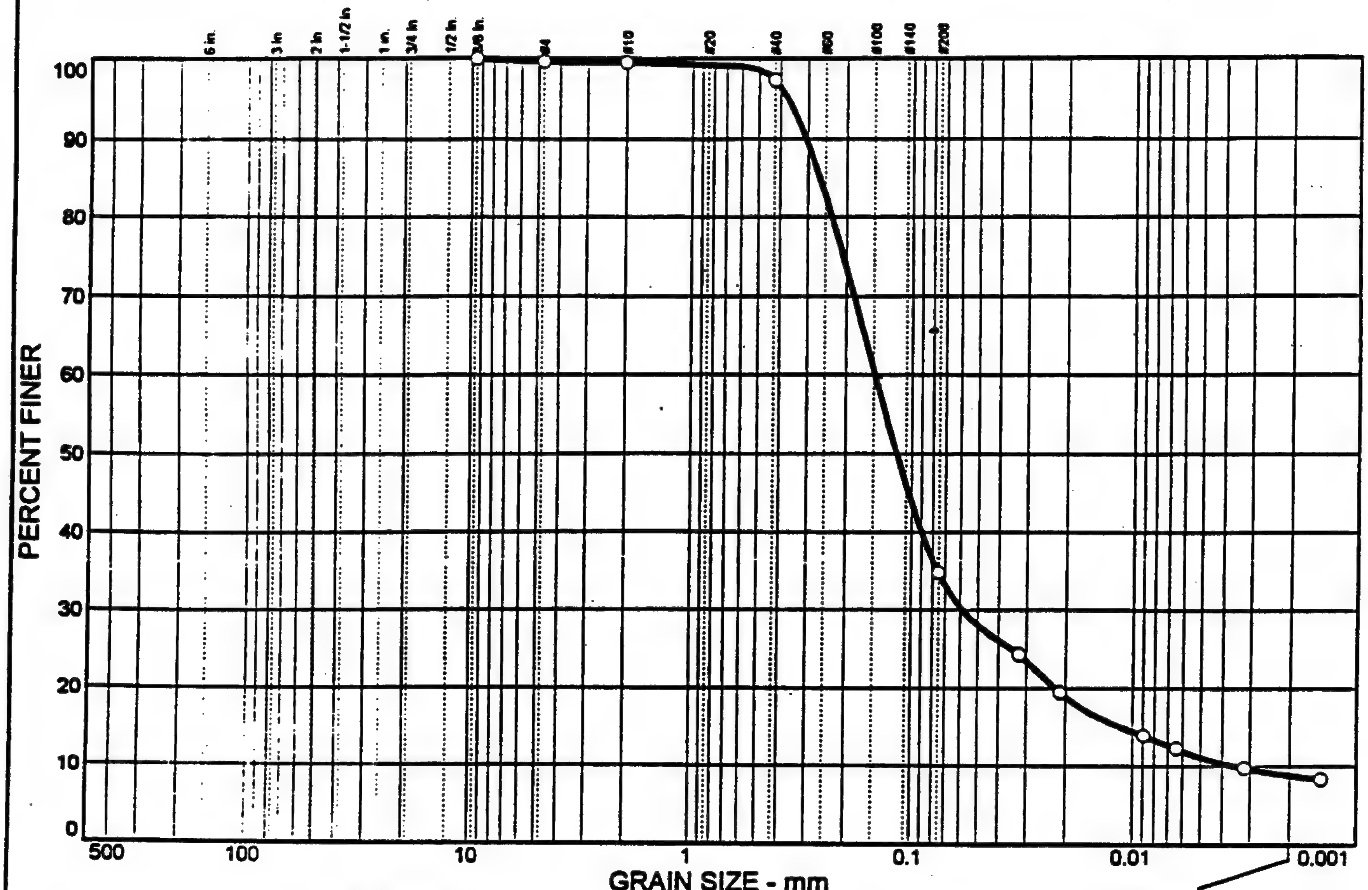
I certify that the data presented as part of this report meets the minimum quality assurance standards specified in the referenced analytical method(s). Based on my review of the data, I believe that the submitted information is true, accurate, complete and meets the minimum standards specified in 40 CFR 136, 40 CFR 763, and/or SW-846. Any exceptions encountered in the analysis of samples contained within this report have been noted and an assessment of the quality of the data is presented. I am aware that there are significant penalties for submitting with knowledge, false information, including the possibility of fines and/or imprisonment.

DLZ Laboratories, Inc.

Melinda Pauff

Quality Control Manager

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.4	0.1	2.2	62.5	26.0	8.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.6		
#10	99.5		
#40	97.3		
#200	34.8		

* (no specification provided)

Soil Description

Silty sand

Atterberg Limits

PL= LL= NP PI= NP

Coefficients

D_{85}= 0.264 D_{60}= 0.147 D_{50}= 0.117
D_{30}= 0.0584 D_{15}= 0.0112 D_{10}= 0.0035
C_u= 41.42 C_c= 6.53

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

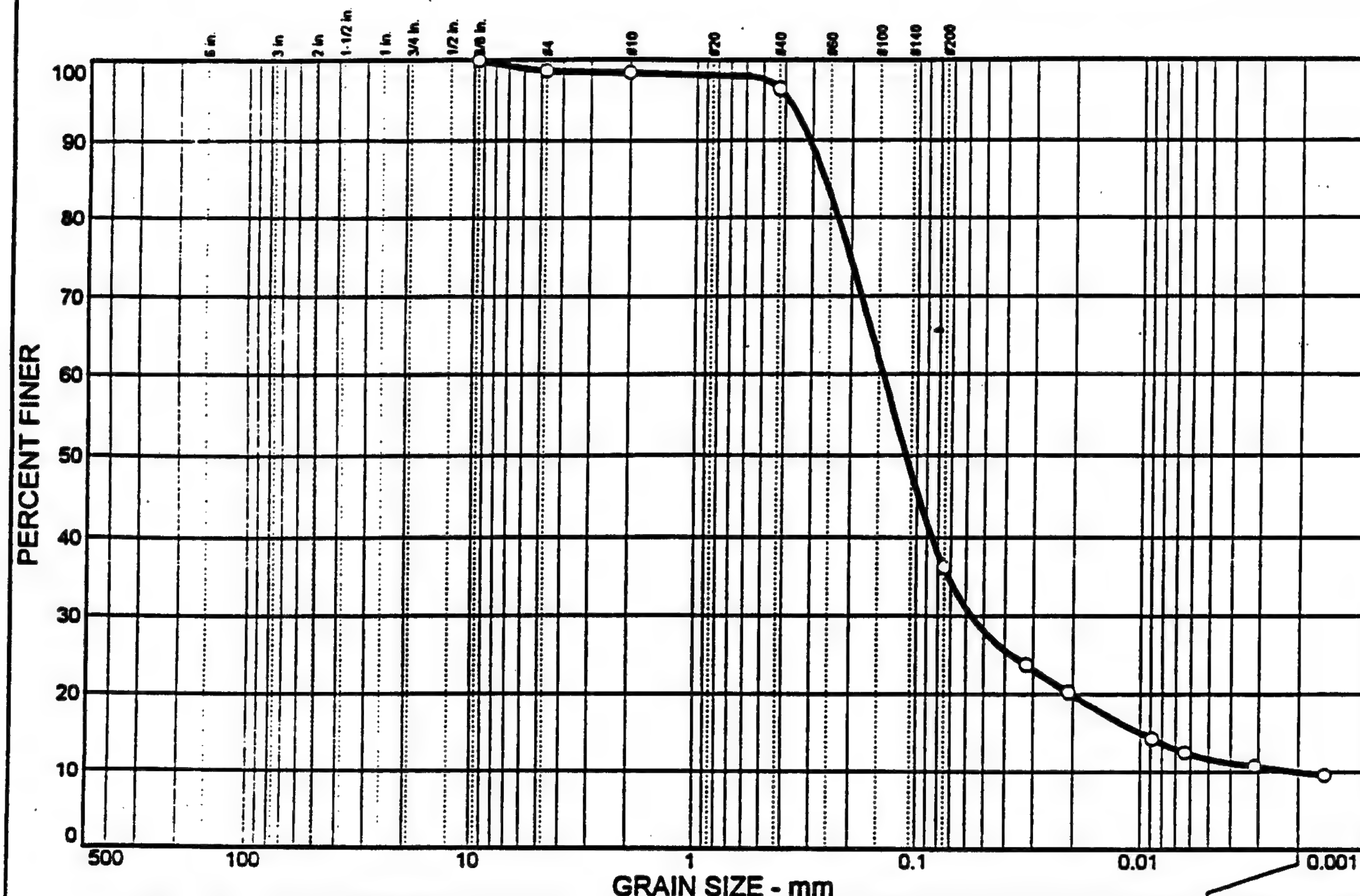
Moisture Content: 8.9%

Sample No.: B-NV14-U-4X **Source of Sample:** **Date:** 11/22/96
Location: **Elev./Depth:**

DODSON-STILSON, INC.

Client: Battelle
Project: Fort Polk
Project No: 9621-3150-00

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	1.3	0.3	1.9	60.3	26.2	10.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	98.7		
#10	98.4		
#40	96.5		
#200	36.2		

* (no specification provided)

Soil Description

Silty sand

Atterberg Limits

PL= LL= np PI= np

Coefficients

D_{85}= 0.263 D_{60}= 0.142 D_{50}= 0.112
D_{30}= 0.0564 D_{15}= 0.0099 D_{10}= 0.0020
C_u= 69.53 C_c= 10.92

Classification

USCS= SM AASHTO= A-4(0)

Remarks

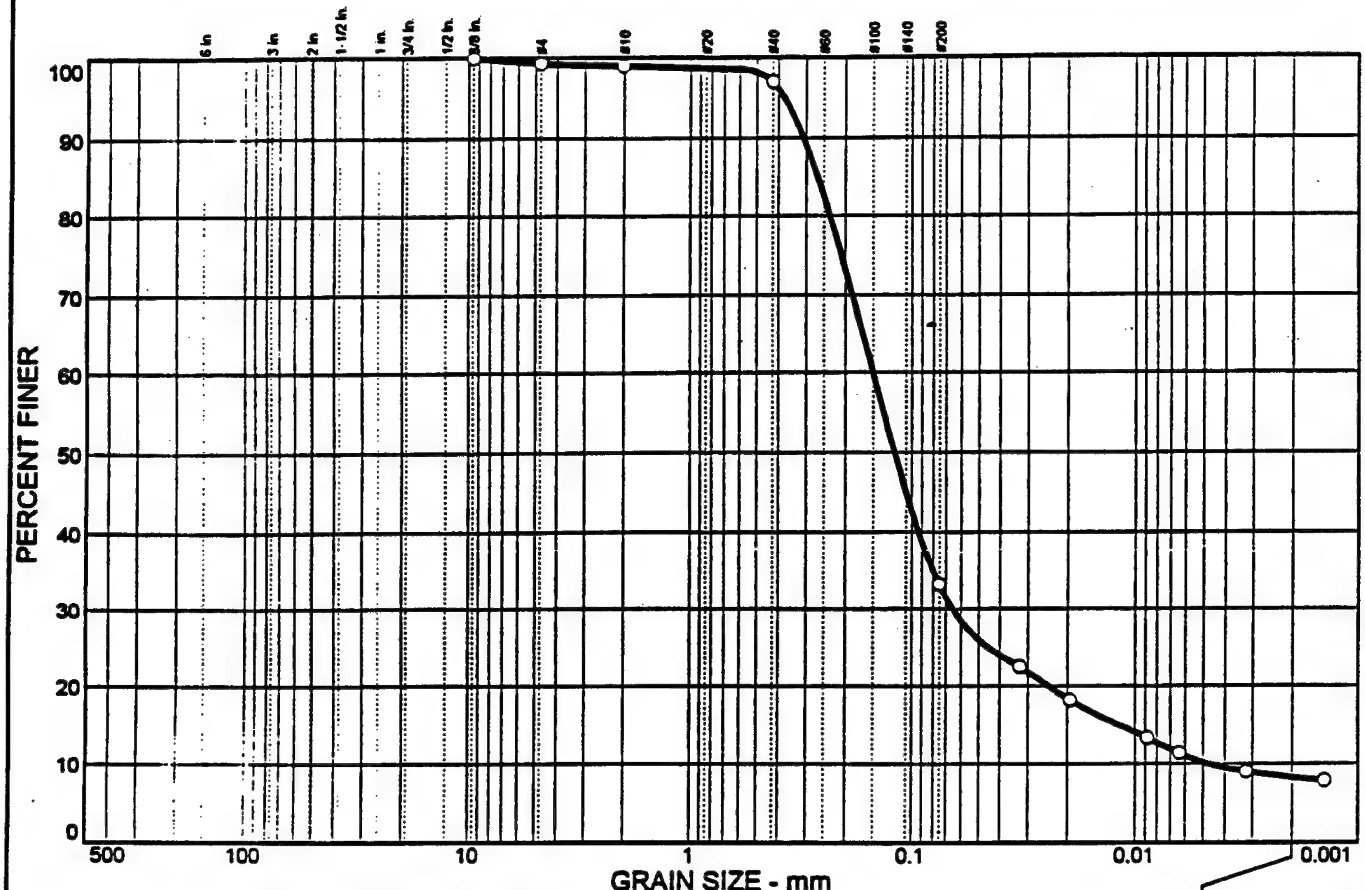
Moisture Content: 9.1%

Sample No.: B-NV14-U-5X **Source of Sample:** **Date:** 11/22/96
Location: **Elev./Depth:**

DODSON-STILSON, INC.

Client: Battelle
Project: Fort Polk
Project No: 9621-3150-00

PARTICLE SIZE DISTRIBUTION TEST REPORT



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.7	0.3	2.0	63.8	25.0	8.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.3		
#10	99.0		
#40	97.0		
#200	33.2		

* (no specification provided)

Soil Description

Silty sand

Atterberg Limits

PL= LL= NP PI= NP

Coefficients

D_{85}= 0.266 D_{60}= 0.149 D_{50}= 0.119
D_{30}= 0.0653 D_{15}= 0.0118 D_{10}= 0.0047
C_u= 31.70 C_c= 6.06

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Moisture Content: 8.9%

Sample No.: B-NV14-U-6X **Source of Sample:** **Date:** 11/22/96
Location: **Elev./Depth:**

DODSON-STILSON, INC.

Client: Battelle
Project: Fort Polk
Project No: 9621-3150-00

:HEMAX Laboratories, Inc.

alytical and Environmental Chemists
A Lab ID #NV004

(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

:port To: Alpha Analytical, Inc.
255 Glendale Avenue, Suite 21
Sparks, NV 89431

Lab Report No.: 16693
Account No.: ALPHA

:lephone: 355-1044

Fax: 355-0406

ork Authorized By: Randy Gardner
ate Sampled: 02/20/97
umber of Samples: 2
urce: See Below
emax Control No. 97-0872 & 0873
otes:

Date Submitted: 02/25/97
Sampled By: Client
Your Reference: BMI022597

Parameter	Results	
	BNV 30-T-1A	BNV 22-T-1B
Cal WET Metals:		
Antimony, mg/L	2.1	5.1
Copper, mg/L	3.1	2.5
Lead, mg/L	19	9.4
Zinc, mg/L	<1	<1

:marks:

alysis By: Faulstich

Date: 02/28/97

pproved By:

Date: 02/28/97

Page 1 of 1

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

APPENDIX D
Bench-Scale Tests

Acetic Acid Bench-Scale Tests

ContraCon Northwest conducted a series of three bench-scale test programs over the period June 23 through August 7, 1996. The first two test programs produced erratic results due to problems with laboratory technique for removal of the particulate lead, but the third program indicated a reduction in total lead concentration to 410 mg/kg overall with a TCLP lead concentration of 12 mg/L. The basic bench-scale program was developed to simulate the performance of the full-scale system as shown in Table D-1.

Table D-1. Comparison of Bench-Scale and Full-Scale Process Steps for Vendor 1 (Acetic Acid Process)

Bench-Scale Procedure	Related Full-Scale Function
Attrition scrubbing (hand-held power mixer)	Attrition scrubbing (blade mill)
Physical separation (wet screening)	Physical separation (vibrating sieve, blade mill, hydrocyclones, sandscrew)
Removal of particulate lead (panning)	Removal of particulate lead (jigs)
Acid leaching and attrition scrubbing of sands (beakers)	Acid leaching and attrition scrubbing of sands (blade mill, sand screw)
Acid leaching of fines (beakers)	Acid leaching of fines (leaching tanks)
Flocculation of suspended particles (beaker)	Flocculation of suspended particles (leaching tanks)
Dewatering of fines (centrifuge)	Dewatering of fines (vacuum belt filter)
Precipitation of lead (beaker)	Precipitation of lead (precipitation tank)

Approximately 10 gal of soil was provided by BDM to ContraCon Northwest for the bench-scale tests. Table D-2 presents the distribution of lead, copper, zinc, and antimony in various size fractions as obtained by wet sieving.

For each of the test programs, a 2,000- to 5,000-g sample was placed in a 5-gal container to which was added 4 to 6 L of acetic acid solution at pH 3.5. The mixture was mechanically agitated in the container for about 40 minutes. After this "attrition scrubbing" was completed, the acid solution was decanted and the soil wet screened through a sieve stack (1/2-inch, 3/8-inch, ¼-inch, 20-mesh, 100-mesh, and 200-mesh) using fresh acetic acid solution at pH 3.5. The soil fractions were then panned to remove particulate lead.

Table D-2. Metal Distribution by Size Fraction

Sieve	Weight (grams-wet)	Weight %	Pb (mg/kg)	Cu (mg/kg)	Zn (mg/kg)	Sb (mg/kg)	Notes
¼ in.	173.5	3.4	3560	582	71.3	10	Metal fragments removed
20 mesh	117.8	2.3	102,000	17300	1890	790	80-90% organics
100 mesh	3211	63.7	1250	111	72.7	37	
-100 mesh	1546	30.6	2460	303	198	62	
Total	**5049**	**100**	---	---	---	---	

The acetic acid solution remaining at this point contains the fine fraction of the sample. The pH was reduced to 2.5 by adding concentrated acetic acid, flocculant was then mixed in, and the solution was placed in a beaker and stirred slowly for 70 minutes with a magnetic stirrer to allow the solids to leach and settle. The leach solution was decanted, and the process repeated two more times. The solids were then dewatered in a centrifuge. The centrifuged solids (fines) were recombined with the coarser fractions from the panning operation. The leachate from the three leaching operations was collected and treated with one or more proprietary precipitants and flocculants to remove the dissolved lead.

The treated soil fraction larger than 100 mesh had a total lead concentration of 300 mg/kg and a TCLP lead concentration of 11 mg/L. The fraction smaller than 100 mesh had a total lead concentration of 790 mg/kg and a TCLP lead concentration of 9.2 mg/L. The recombined soils had a concentration of 410 mg/kg and a TCLP lead concentration of 12 mg/L.
The unit process removal efficiencies were as follows:

- The attrition scrubbing and screening removed 87% of the lead
- The gravity separation process reduced lead contamination by over 76% (not including removal of the organic materials)
- The acid leaching process reduced the lead concentration in the fines by 67%.

The overall removal efficiency was calculated to be 98%. The most critical factor in achieving the desired removal efficiency was the physical removal of particulate lead.

The following were missing from these bench-scale tests:

- Tests to optimize lead recovery from the leachate under the low pH conditions maintained during the demonstration
- Tests for determining the type and size of equipment required for solid-liquid separation operations

Hydrochloric Acid Bench-Scale Tests

BESCORP conducted bench-scale tests as first recorded in a draft report on July 23, 1996. The tests indicated that a reduction in total lead concentration to 240 mg/kg overall with a TCLP lead concentration of 4.2 mg/L were possible. The basic bench-scale program was developed to simulate the performance of the full-scale system as shown in Table D-3.

Table D-3. Comparison of Bench-Scale and Full-Scale Process Steps for Vendor 2 (Hydrochloric Acid Process)

Bench-Scale Procedure	Related Full-Scale Function
Physical separation (wet screening)	Physical separation (sandscrew)
Removal of particulate lead (panning)	Removal of particulate lead (jigs)
Acid leaching and attrition scrubbing of sands (beakers)	Acid leaching and attrition scrubbing of sands (log washer, sandscrews)
Acid leaching fines (beakers)	Acid leaching of fines (clarifiers)
Precipitation of lead and flocculation of suspended particles (beakers)	Precipitation of lead and flocculation of suspended particles (thickener)
Dewatering of precipitate (gravity and filter tests)	Dewatering of precipitate (thickener and filter press)

The particle-size distribution of the Fort Polk samples received from BDM was determined by wet sieving the samples. For the 10-gallon composite of Berm 2 and Berm 3 soils, 4-, 20-, 60-, 140-, and 200-mesh sieves were used. The occurrence of particulate lead in each size fraction was then determined.

Density separation techniques were evaluated for the gravel, sands, and fines soil fractions. Water-pulse jigging was employed for the gravel fraction (+4 mesh), and gold panning was employed for both the sands fraction (4 x 200 mesh) and the fines fraction (-200 mesh).

The acid leaching studies were tailored to the parameters imposed by the field treatment equipment. The sands and fines were treated separately. Leachant pH and contact time were varied to optimize lead removal from the sands. Leachant pH and leachant to soil mass ratios were varied to optimize lead removal from the fines with the fewest number of leachant contacts. Testing was done at beaker-level followed by larger kilogram-sized samples.

Precipitation studies eventually focused on hydroxide since the lead sulfide floc was too shear sensitive for field application. The pH coagulant dosages were optimized to improve the settling and handling characteristics of the hydroxide floc particles. Floc settling tests were then performed to size the precipitation unit. Finally, solid-liquid separation tests were performed to select filter media and size the field unit.

Table D-4 presents the characterization data for the various size fractions.

Table D-4. Feed Soil Metals by Size Fraction

+4 Mesh Fraction (Gravel) Pb/Cu (mg/kg)	4 x 200 Mesh Fraction (Sands) Pb/Cu (mg/kg)	-200 Mesh Fraction (Fines) Pb/Cu (mg/kg)
623/80	720/182	1788/233
50000/150	740/377	1747/77
4000/330	742/220	1770/120
Averages	**734/259**	**1768/143**

The gravel fraction was not averaged because of the extreme variations between samples resulting from large metal fragments present in the matrix. The metals content of this fraction was observed to be as high as 92%.

The results of density treatment of the sands are presented in Table D-5.

Table D-5. Density Treatment of the Sands Fraction

Average Pb Before Treatment (mg/kg)	Pb After Treatment (mg/kg)	Percent Pb Removed (%)
734	544	26
	648	12
	494	33
	590	20
	---	Avg. = 23

Leaching tests were performed separatedly on the sands and fines. One finding was that the sands fraction contains a higher percentage of the TCLP-failing lead. Consequently, leaching the lead from the sands fraction was essential to ensure passage of the TCLP. The bench-scale studies indicated that leaching the sands at pH 1.5 for twenty minutes reduced the lead concentrations from approximately 500 mg/kg to about 230 mg/kg. Multiple leaching of the fines resulted in a reduction of lead concentration from an initial value of 2,800 mg/kg to about 440 mg/kg. Table D-6 presents the bench-scale data for multiple contacts of the fines with pH 1.5 leachant and the associated components for the field-scale process.

Table D-6 Modeled Bench-Scale Treatment of Soil Fines

Process Unit Modeled	Contact Ratio Leachant:Solid	Leachant Lead (mg/L)	Fines Lead (mg/kg)	Removal (%)
Log Washer, Sandscrew #1, Jig, Clarifier #1	12:1	199	840	70
Clarifier #2	4:1	84	476	13
Centrifuge Dilution	4:1	33	340	5

As shown in Table D-6, up to 88% of the lead in the fines fraction was amenable to leaching with the componentry indicated. The treated sands fraction had total and TCLP lead concentrations of 238 mg/kg and 6.4 mg/L, respectively. The treated fines fraction had total and TCLP lead concentrations of 441mg/kg and 3.04 mg/L, respectively. The recombined treated soil contained total and TCLP lead concentrations of 245 mg/kg and 4.24 mg/L, respectively, indicating that the treatment objectives could be met.

APPENDIX E
Comparison of Alternative Technologies

This appendix presents alternative technologies in addition to the physical separation and acid leaching technologies demonstrated at Fort Polk and the alternative technologies mentioned in Section 8.0. The comparison follows the same two-stage screening approach applied in Section 8.0. A variety of reference documents are available if more detailed technology performance and selection data are required (Conner, 1990; U.S. EPA, 1992, EPA/540/2-91/014; U.S. EPA, 1992, EPA/540/S-92/011; U.S. EPA, 1995, EPA/540/R-95/512)

E.1 Technology Review and Prescreening

This section provides overviews of a broad range of technologies that can be applied to remediate metal contamination in small-arms range soils.

E.1.1 On-Site Asphalt Encapsulation

Contaminated small-arms range soils can be used as part of the fine aggregate in asphaltic concrete. The recycling of wastes as aggregate in asphaltic concrete is not a particularly new concept. A wide variety of industrial solid wastes have been successfully substituted for some portion of asphalt graded aggregate without adverse effects on product quality. Using oil contaminated soil as asphalt aggregate in construction projects has been practiced for many years (U.S. EPA, 1992, EPA/600/R-92/096). Recycling of RCRA hazardous waste as asphalt aggregate will encounter greater regulatory hurdles.

The recycling technology involves substituting the waste for a portion of the fine-size aggregate in asphaltic concrete. Typically, asphaltic concrete consists of 4.5 to 8% bitumen mixed with graded aggregate. The aggregate is made by mixing rock and sand to give particles ranging from fine sand to 2- to 1-in. (13 mm to 25 mm) gravel. Depending on the mix design and the ultimate strength requirements of the product, the fine-size particle fraction may comprise 35 to 45% of the asphaltic concrete. As long as the metal concentrations in the waste are low, the metal concentrations in the asphaltic concrete product will be low, and any metals present will be physically and chemically immobilized in the bitumen binder.

The asphalt recycling approach is viable for only certain types of aggregates. The aggregate must comply with both performance and environmental standards such as durability, stability, chemical resistance, biological resistance, permeability, and leachability (Testa and Patton, 1994). A sharp, angular particle shape is preferred for asphaltic concrete aggregate. The principal limitations pertain to risk, regulatory considerations, or technical considerations pertaining to the integrity of the asphaltic concrete product.

Some asphalt paving companies accept nonhazardous waste that is delivered to their plant and that has desirable properties without charging a tolling fee. These direct aggregate replacement wastes can be recycled for the cost of excavation, screening, and hauling. Small-arms range soils would typically exhibit a hazardous waste characteristic and would not be accepted for general

use asphalt. There have been cases of lead contaminated soils being used in asphalt paving placed at the cleanup site, but significant risk assessment analysis and regulatory interaction is required.

E.1.2 In Situ Electrokinetic Treatment

Electrokinetic technology removes metals from soil and groundwater by applying an electric field in the subsurface to induce movement of ions, particulates, and water through the soil. The electrokinetic phenomenon occurs when liquid migrates through a charged porous medium, typically clay, sand, or other mineral particulate that normally has a negative surface charge.

The electrical field is applied through anodes and cathodes placed in the soil. Most metals form positively charged ions that migrate toward the negatively charged electrode. Metal anions such as chromates migrate to the positively charged electrode, and concentration gradients in the soil solution are established between the cathode and anode. The imposed electrical field drives diffusion of metal ions from areas of low concentration to areas of high concentration. The viscous drag due to movement of the cations also induces a net flow of water to the cathode (Marks et al., 1992).

The spacing of wells containing the cathode and anode depends on site-specific factors. The cathode and the anode housings can be provided with separate circulation systems filled with different chemical solutions to maximize recovery of metals. The contaminants are captured in these solutions and brought to the surface for treatment in a purification system.

Electrokinetic treatment concentrates metals at the cathode to allow recovery of contaminants from the in situ material. Typically the solution will require subsequent treatment for metals removal prior to reinjection or discharge. A variety of water treatment techniques can be applied to remove the recovered metals and render the extraction fluid suitable for reuse.

Electrokinetic separation may be applied to enhance phase separation, concentrate ionic species, or both. Chemical species that form ions in solution that can migrate under the influence of the electrical field can be effectively concentrated. Mobility of fluids is also enhanced by the electroosmosis, so the electrokinetic method can be applied to improve dewatering of a material.

Electrokinetic treatment is most applicable to saturated soil with nearly static groundwater flow and moderate to low permeability. A low groundwater flow rate is required so that ionic diffusion rather than advective flow is the main transport mechanism. Water is required to provide a polar medium for ion flow. Electrokinetic treatment is less dependent on high soil permeability than are the in situ metals extraction technologies such as soil flushing. The electrokinetic separation occurs due to ionic migration rather than bulk fluid flow. Fine-grained clay soils are reported to be an ideal medium for electrokinetic treatment (U.S. EPA, 1992, EPA/540/R-92/077). As a result, electrokinetic separation could be applied in soils where soil flushing flow rates are too low to be practical.

Electrochemical reactions at the electrodes are unavoidable side effects of electrokinetic separation techniques. The most likely reaction is electrolysis of the water. The reaction at the cathode is production of hydrogen gas and hydroxide ions. The hydrogen gas escapes, causing the pH to rise. Increases of pH to above 13 have been reported in the vicinity of the cathode (U.S. EPA, 1990, EPA/540/2-90/002). Similarly, evolution of oxygen and production of hydrogen ions occurs at the anode, causing acidification of the anode area. During operation of electrokinetic treatment, the acid front migrates away from the anode. Generation of acid is reported to be a major contributor to dissolution and mobilization of metal contaminants (Probstein and Hicks, 1993).

Other electrochemical reactions may also occur. Chloride ions, which are often present in natural waters, may be reduced to form chlorine gas. Chemical and electrochemical processes may result in precipitation of solid materials, such as iron or chromium hydroxides, that plug pores in the formation and reduce permeability to unacceptable levels (U.S. EPA, 1991, EPA/540/2-91/009).

E.1.3 In Situ Solidification/Stabilization (S/S)

In situ S/S treatment eliminates the labor and energy expenses that are involved in soil excavation, transport, and replacement or disposal of the treated soils. Another practical advantage is the capability of working at space-constrained sites, such as around or between buildings, tanks, and other obstructions. However, a significant challenge in applying S/S in situ for contaminated soils is the achievement of complete and uniform mixing of the binder with the contaminated matrix (U.S. EPA, 1990, EPA/540/2-90/002). Other disadvantages of in situ methods are that they are unworkable in the presence of bedrock or boulders, or are impeded in the presence of clays, oily sands, and cohesive soils. Low production rates under these circumstances may require ex situ treatment. The three basic approaches for mixing the binder with the matrix are:

- ☐ In-place mixing
- ☐ Vertical auger mixing
- ☐ Injection grouting.

In-place mixing. In-place mixing involves spreading and mixing of binder reagents with waste by conventional earth-moving equipment such as draglines, backhoes, or clamshell buckets. The technology is applicable only to surface or shallow deposits of contamination.

Vertical auger mixing. In vertical auger mixing, a system of augers is used to inject and mix binder into the soil. This technology is adapted from the construction boring industry and involves caisson-type augers. Both shallow (10 to 20 feet) and deep (up to 150 feet) drilling can be accomplished using this technology. Shallow mixing usually involves a single 12-foot-diameter auger mounted on a crawler crane (AFCEE, 1992). Dry reagents and water (if needed) are pneumatically dispersed into the soil as the auger creates a pattern of overlapping 12-foot-diameter columns. Deep stabilization uses 2 to 4 "ganged" augers, each up to 3 feet in diameter, to loosen the subsoil and mix in the binder (AFCEE, 1992). Shallow auger systems can process

500 to 1,000 cubic yards per day, and deep auger systems can process 150 to 400 cubic yards per day. Of course, exact processing rates depend quite substantially on the specific site.

Injection grouting. For injection grouting, a binder containing dissolved or suspended treatment agents is forced into the formation under pressure and allowed to permeate the soil. The injected grout then cures in place to give an in situ treated mass. One vendor uses a nominal 2-inch-diameter well to treat a soil column of up to 3 feet in diameter. The depths achieved are comparable to those using soil augers.

E.1.4 Pyrometallurgical Metal Recovery

Lead can be recovered from soils using existing high-temperature processing plants (pyrometallurgical processing). Metal concentrations should be in the percent range for efficient application of pyrometallurgical methods. Two different approaches are available for using pyrometallurgical processing to recover lead from small-arms range soils:

- Processing in a primary lead smelter
- Modification of second smelter processing to accept lower grade feed.

Table E-1 indicates the locations of smelters in the United States that may accept bullets or soils from small-arms ranges. This tabulation outlines the local availability for smelters and gives a place to start making contacts when trying to locate a recycler. The listing is not intended to be comprehensive nor an endorsement or approval of these facilities. Users are encouraged to research the compliance status of any processor they select. A fee in the range of \$100/ton to \$300/ton (plus shipping at \$0.07/ton-mile to \$0.15/ton-mile) would be charged to accept low grade materials in any of these alternatives.

Primary smelters provide a first stage of processsing that increases the lead content and reduces impurity levels. The product from the primary smelter goes to a secondary smelter to produce the final high purity soft lead and hard lead alloys. Soils containing as little as 500 mg/kg lead would be compatible with primary smelters. In primary smelting, lead content is of minor importance because the soil acts more as a silica, calcium, and iron source to assist in slag formation than as a major contributor of lead. Granular sandy soils are more favorable, whereas a high proportion of finer, particle-size silt and clay would make contaminated soil unfavorable for use in a primary smelter. Fine soil fractions might require pelletization or other processing to agglomerate particles into the size range that is compatible with the primary smelting process (e.g., a blast furnace).

The Center for Hazardous Materials Research and Exide/General Battery Corporation are demonstrating the use of secondary lead smelting to reclaim usable lead from waste materials containing between 1 and 50% lead. Waste containing 1 to 25% lead is treated in a reverberatory furnace to produce slag containing about 70% lead. The slag and other high-lead-content materials are fed to a blast furnace to produce lead metal products. Superfund Innovative Technology Evaluation (SITE) Program testing has been performed on a variety of waste materials including battery cases, slags, lead dross, and lead paint chips (U.S. EPA, 1993,

EPA/542/N-93/005). Low grade materials from Superfund or other contaminated sites could be mixed with higher grade lead material to allow processing in a secondary smelter (U.S. EPA, 1992, EPA/540/R-92/077).

Table E-1. Locations of Pyrometallurgical Plants for Processing Bullets or Soils from Small-Arms Ranges

Company	Location	Smelter Type	Process Bullets	Process Soils
ASARCO, Inc.	Glover, MO	Primary	No	Yes
ASARCO, Inc.	East Helena, MT	Primay	No	Yes
Doe Run, Co.	Boss, MO	Primary	Yes	Yes
Doe Run, Co.	Herulaneum, MO	Secondary	Yes	No
East Penn Mfg., Co., Inc.	Lyon Station, PA	Secondary	Yes	No
Exide, Corp.	Muncie, PA	Secondary	Yes	Yes
Exide, Corp.	Reading, PA	Secondary	Yes	Yes
Gopher Smelting and Refining	Eagan, MN	Secondary	>25%	No
RSR Corp.	Middletown, NY	Secondary	Yes	No
RSR Corp.	Indianapolis, IN	Secondary	Yes	No
RSR Corp.	City of Industry, CA	Secondary	Yes	No
Schuylkill Metals Corp.	Baton Rouge, LA	Secondary	>50%	No
Schuylkill Metals Corp.	Forest City, MO	Secondary	>50%	No

Source: adapted from Lead Industries Association, 1992; U.S. EPA, 1995, EPA/540/R-95/512.

E.1.5 Vitrification

The vitrification process can incorporate oxides of nearly all the elements of the periodic table (U.S. EPA, 1992, EPA/625/R-92/002). Vitrification, or making glass out of wastes, can be performed ex situ on excavated waste or in situ to destroy organic contaminants and immobilize metals and radioactive elements into a chemically durable, leach-resistant solid. Due to the melting and densification of minerals, combustion or volatilization of organics, and vaporization of water, the glass product from vitrification occupies less volume than the waste feed.

A wide variety of melters have been developed for vitrification of excavated soils. Both electrical resistance heating and fossil fuel combustion have been used as energy sources to melt wastes (Smith, et al., 1995) With the addition of low-cost materials such as sand, clay, and/or native soil, the process can be adjusted to produce products with specific characteristics, such as chemical durability. The vitrification process can accommodate different chemical and physical forms of matter including liquids, slurries, sludges, combustible or noncombustible solids, and mixtures of these physicochemical states. This makes vitrification an attractive method of waste treatment because a single technology can process widely different materials.
Vitrification in situ is a thermal treatment process that converts contaminated soils to a stable

glass and crystalline monolith (U.S. EPA, 1992, EPA/625/R-92/002). The in situ vitrification (ISV) technology is based on electric melter technology, and the principle of operation is joule heating, which occurs when an electrical current is passed through a region that behaves as a resistive heating element. Electrical current is passed through the soil by means of an array of electrodes inserted vertically into the surface of the contaminated soil zone. Because dry soil is not conductive, a starter path of flaked graphite and glass frit is placed in a small trench between the electrodes to act as the initial flow path for electricity. Resistance heating in the starter path transfers heat to the soil, which then begins to melt. Once molten, the soil becomes conductive. The melt grows outward and downward as power is gradually increased to the full constant operating power level. A single melt can treat a region of up to 1,000 tons. The maximum treatment depth has been demonstrated to be about 20 feet. Large contaminated areas are treated in multiple settings that fuse the blocks together to form one large monolith (Buelt et al., 1987).

Vitrification, whether ex situ or in situ, has proven to be expensive to implement. The typical estimated range of costs for vitrification of hazardous waste soil is $400/ton to $800/ton.

E.1.6 Technology Prescreening

Asphalt encapsulation is not considered for detailed evaluation because of effectiveness and implementability limitations. Asphalt encapsulation is effective for immobilizing moderate concentrations of metal contaminants in a silicate matrix. Use in asphalt has not been demonstrated on wastes with the high lead concentrations that can be encountered in small-arms range soils. Reuse of a soil that failed the TCLP in paving is expected to encounter strong regulatory and stakeholder resistance. Successful implementation of the asphalt alternative requires the waste matrix to have specific particle size and shape properties. The requirement to have clean sandy soil as the matrix limits the applicability of ashpalt encapsulation for treating small-arms range soils.

Electrokinetic extraction is not retained for detailed evaluation because of implementability limitations. Electokinetics is most applicable to saturated zone soils, whereas contamination at small-arms ranges is usually limited to surface soils. Electrokinetics extraction has not reached a sufficient level of maturity to establish cleanup performance capabilities or costs and, therefore, is not retained for detailed evaluation. Electrokinetic extraction is being actively developed and applied in Europe, but field testing in the United States has given mixed results. Site cleanup using electrokinetic extraction could cause the range to be out-of-service for months, which increases the difficulty of implementation because most small-arms ranges are in continuous use.

In situ S/S is not considered for detailed screening because of implementability limitations. In situ S/S can effectively immobilize metal contaminants, but treated soil would harden on curing making it unsuitable for continued use in range areas without a covering of clean soil. In situ S/S would be difficult to implement on the steep contours of an impact berm.

Pyrometallurgical extraction is useful for managing waste streams containing bullets and bullet fragments produced by screening soil and similar smaller volume waste residuals. The lead

content in small-arms range soils will be too low to allow recycling to a secondary smelter. There are only two primary smelters operating in the United States. Unless the range is near east central Missori or East Helena, Montana, the costs of shipping and processing make the pyrometallurgical alternative too expensive for the bulk of the contaminated soil from a range.

Vitrification of excavated soil is not considered for detailed screening because of implementability and cost limitations. Ex situ vitrification can effectively immobilize metal contaminants, but commercial acceptance is limited by the high cost of the technology. A small-arms range site would be too small to justify construction of a new vitrification plant and the existing processing capacity is limited. Vitrification is an expensive technology that would not be cost-effective for small-arms range remediation.

ISV is not considered for detailed screening because of implementability and cost limitations. ISV can effectively immobilize metal contaminants, but treated soil would be hard and brittle and would not be suitable for continued use in range areas without a covering of clean soil. ISV would be difficult to implement on the steep contours of an impact berm. ISV is an expensive technology that would not be cost-effective for small-arms range remediation.

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APPENDIX E-2
Previous Testing of the Technology

The combination of physical separation and acid leaching is an innovative remedial alternative that has received increasing interest (van Benschoten et al., 1997). Physical separation is a technique for dividing soil into different size or density fractions. Physical separation rarely produces material that is sufficiently clean to allow reuse or disposal directly, but works well as a pretreatment so that the volume of soil requiring leaching is reduced. When particulate contaminants are present, physical separation reduces the contaminant load on the leaching process. Section 2 (of the main report) provides a detailed description of various physical separation and leaching techniques.

Physical separation and acid leaching are particularly useful at sites where metallic contaminants are present as particulates, e.g., small-arms ranges or battery recycling sites. First, oversize debris, such as rocks, that typically have low concentrations of metals is removed. This debris fraction can usually be cleaned easily by washing or leaching with a dilute acid solution. Metal fragments are then separated from the bulk soil based on particle size and density. The separated metals stream may be suitable for off-site recycling. The lighter smaller soil that remains consists of sands, silts, and clay and may also contain very fine metal particulates and bound molecular or ionic metals. The soil particles and associated heavy metal contaminants can be effectively treated with acid leaching. Different extractants may be used depending on the physical and chemical form of the heavy metals and the matrix characteristics.

E.2 Previous Bench-Scale Studies

A number of bench-scale studies that address separation/leaching of lead and other heavy metals from soil have been reported recently.

E.2.1 Acetic Acid Leaching Study

The EPA conducted a bench-scale study (Krishnamurthy, 1992) using acetic acid and other leachants to treat a sample of Louisiana soil that was artificially spiked with various lead species. In the three-step process used, lead sulfate was first converted to lead carbonate with ammonium carbonate. Acetic acid (0.1 M) was then used to leach the carbonate species. Lead dioxide (PbO_2) was converted to lead acetate using manganese acetate. Sodium sulfate was used as a precipitant to recover the lead in the spent leachant as a sulfate.

About 80 to 89% of the total lead was removed from the soil by this three-step process. The treated soil passed the TCLP test for lead. Lead dioxide was the most difficult to dissolve, even with manganese acetate. Dissolution of elemental lead was highly dependent on the particle size of the metal. One hour of contact time with acetic acid resulted in 95% dissolution of lead powder, 65% dissolution of granular lead (30-50 mesh), and only 25% dissolution of lead shot (0.09-inch diameter).

E.2.2 Hydrochloric Acid Leaching Studies

A recently completed bench-scale study examined the ability of hydrochloric acid leaching to reach cleanup goals for lead contaminants in seven soils (van Benschoten et al., 1997). The soils were wet-sieved into two fractions: coarse sand (−4 +20 mesh) and fine sand (−20 +200 mesh). The fine sand was processed by tabling and the coarse sand was processed by jigging. Tabling and jigging are size/density separation methods used to remove high-density particles (see Section 2 of the main report). The lighter fractions or tailings from tabling and jigging were combined and used in the leaching tests.

The results of physical separation and leaching are shown in Tables E-2 and E-3. For the seven soil types, physical separation collected about 30 to 80% of the total lead in the soil as a dense fraction from the table and jig. Removing the dense fraction also reduced leachable lead in the soil by about 40% to 70%, except in soil 2, where the TCLP lead increased slightly in the tailings. Characterization of the unleached tailings consisted of scanning electron microscope (SEM) analysis and sequential extraction methods to identify the chemical speciation of lead. Leaching with HCl was effective in reducing the lead concentrations for most soils, but low pH was essential. The percent lead removed by acid leaching ranged from 22% to 93% for the seven test soils. All of the leached tailings passed the TCLP test criteria, indicating that HCl can successfully treat most lead species.

Table E-2. Total Metals Content from Hydrochloric Acid Leaching Study[a]

Soil	Predominant Lead Species	Treatment Goal Lead Content (mg/kg)	All Soil Lead Content (mg/kg)	Unleached Tailings Lead Content (mg/kg)	Leached[b] Tailings Lead Content (mg/kg)
1	Carbonates	250	11,933	2,185	203
2	Associated with metal oxides	1,000	2,307	1,401	611
3	Oxides and carbonates	1,000	5,913	1,535	200
4	Sulfate	250	3,199	2,195	1,218
5	Oxides and carbonates	1,000	4,808	1,369	98
6	Sulfates, carbonates, oxide	1,000	1,394	500	391
7	Iron sulfate and lead oxide	1,000	4,249	2,755	1,033

(a) van Benschoten et al., 1997.
(b) Treatment conditions are HCl at a pH of 1, 25°C, leachant to solid ratio of 20:1, and 24-hr contact time.

E.2.3 Other Acids

The Bureau of Mines (Wethington et al., 1992) and RSR Corporation (Prengaman and McDonald, 1990) are independently developing similar acid leaching processes to recover lead from lead-contaminated soils and battery wastes such as casings and sulfate-oxide sludge from scrap batteries. The process converts lead sulfate and lead dioxide to lead carbonate, which is

Table E-3. TCLP Test Results from Hydrochloric Acid Leaching Test[a]

Soil	Treatment Goal (mg/L)	All Soil TCLP Lead (mg/L)	Unleached Tailings TCLP Lead (mg/L)	Leached[b] Tailings TCLP Lead (mg/L)
1	0.5	29.5	10.6	0.3
2	0.5	1.27	2.0	0.5
3	0.5	134	41.7	0.8
4	0.5	6.46	4.0	Not done[c]
5	0.5	98.8	40.0	1.5
6	0.5	3.5	0.9	Not done[c]
7	0.5	19.7	11.7	0.7

(a) van Benschoten et al., 1997.
(b) Treatment conditions are HCl at a pH of 1, 25°C, leachant to solid ratio of 20:1, and 24-hr contact time.
(c) Untreated sample passed TCLP.

soluble in fluorosilicic acid. Lead is recovered by electrowinning and the acid is recycled back to the leaching process. The fluorosilicic acid leach may be followed by nitric acid leaching to increase the lead removal. The process generally involves six steps performed in the following order:

- Water wash to remove lead sulfate sludge
- Screening and water elutriation to remove metallic lead, rocks, and foreign material
- Size reduction of oversize pieces
- Carbonation treatment to convert lead sulfate in the ebonite casing to lead carbonate
- Ammonium bisulfite may be added to convert lead oxide to lead sulfate
- Acid washing to dissolve the lead carbonate
- Electrowinning to recover lead metal from solution.

The results of this testing are summarized in the literature and shown in Table E-4.

E.3 Pilot Testing by NFESC and Bureau of Mines

Over the last 5 years, NFESC and the Bureau of Mines Research Center (BMRC) have studied remediation of lead-contaminated soils associated with small-arms ranges using physical separation and leaching methods developed for mineral processing (Johnson et al., 1994). NFESC wanted to explore the possibility of using physical separation to remove particulate lead before using stabilization or soil washing to treat the molecular or ionic lead. BMRC used its knowledge of mining techniques to develop a separation scheme that, in pilot studies, recovered a significant amount of lead from soils taken from various sites. For one of the sites where lead

Table E-4. Results of the Bureau of Mines Treatability Tests on Lead-Contaminated Soils

Site/Matrix	Untreated Material: Predominant Lead Species	Untreated Material: Average Total Lead (mg/kg)	Treated Material: Leaching Treatment Method	Treated Material: Total Lead After Treatment (mg/kg)	Treated Material: EP Toxicity Leachable Lead After Treatment
United Scrap Lead/Soil	Pb, $PbSO_4$, PbO_2	8,000 - 18,000	HNO_3*	200	<1
United Scrap Lead/Soil	Pb (2%), $PbSO_4$, PbO_2	8,000 - 18,000	H_2SiF_6/HNO_3	203	<1
Arcanum/Soil	Pb (6.6%), $PbSO_4$	71,000	H_2SiF_6/HNO_3	330	0.26
Arcanum/Soil	Pb (6.6%), $PbSO_4$	71,000	HNO_3	<250	<1
C&R Battery/Soil	Pb, $PbSO_4$, $PbCO_3$, PbO_2	17,000	HNO_3	29	<0.1

Source: U.S. EPA, 1991, EPA/540/2-91/009.

contamination was predominantly particulate, physical separation was able to recover lead to a level where the soil passed the TCLP test without having to undergo further chemical treatment. The separation scheme arrived at by BMRC after trying different combinations is shown in Figure E-1. Although many users could probably achieve acceptable results with less complex operations, this flowchart shows how each piece of equipment was optimized to do what it does best. The plant operation is as follows:

- The lead-contaminated soil first is loaded into a feed hopper through a 1-inch grizzly. The grizzly removes rocks, branches, etc. The soil is fed via a conveyor belt to a two-deck (3 mesh and 20 mesh) vibrating screen. Water is added at the screen for wet screening; alternatively, a 20% slurry of the soil in water could be prepared separately and fed to the screen. The +3-mesh fraction containing a combination of bullets, bullet fragments, and pebbles is collected in a drum. This fraction can be sent to a lead smelter for recycling.

- The −3+20-mesh fraction is sent to a jig, and the jig concentrate (consisting of lead fragments) is drummed for recycling. The overflow from the jig goes to chemical treatment (heap leaching in this case).

- The −20-mesh fraction from the screen goes to a spiral classifier to remove slimes. The slimes (ultrafine particulate) go to the thickener for dewatering. The sludge from the thickener is fed to a Bartles-Mozley Table. The concentrate from the table is dewatered in a spiral classifier and drummed for recycling. The tailings are dewatered, first in a thickener (with addition of flocculant), and then in a centrifuge. The solids from the centrifuge are further treated chemically.

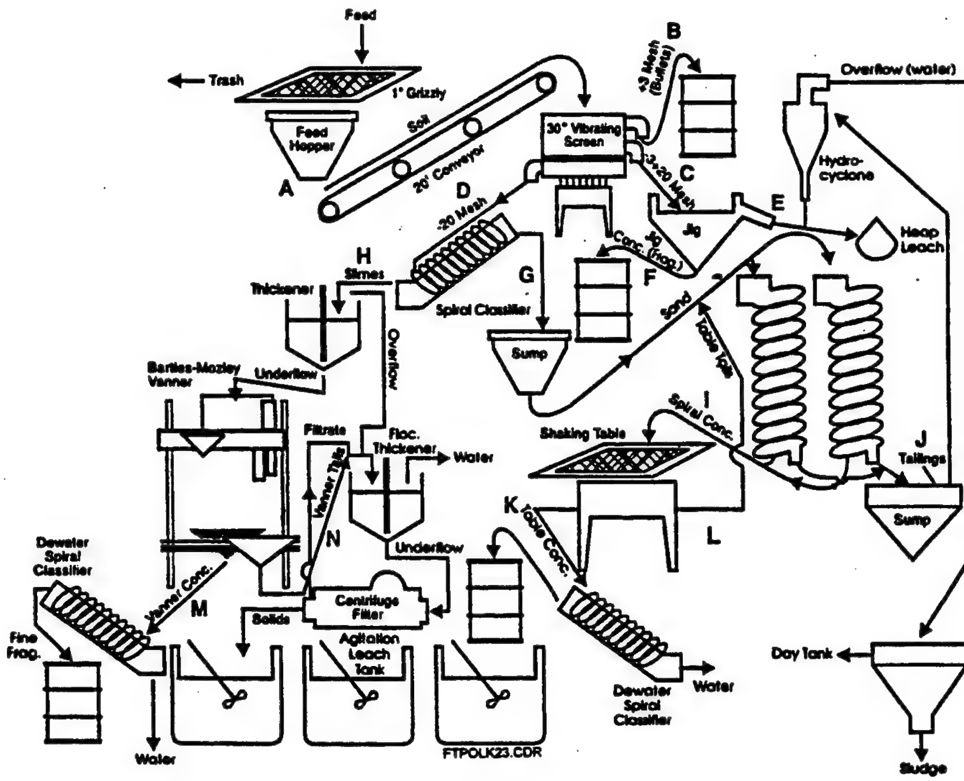

Figure E-1. Bureau of Mines Process for Treating Small-Arms Range Soils

- The bulk of the −20 mesh fraction coming out of the screen and through the first spiral classifier is collected in a sump, from which it is pumped to the top of two spiral concentrators. The tailings from the spirals are dewatered in a hydrocyclone and sent to chemical treatment. The overflow water from the hydrocyclone is clarified and sent to a day tank for storage and reuse.

- The concentrate from the spirals is sent to a riffled shaking table. The table concentrate is dewatered in a spiral classifier and collected in a drum for recycling. The table tailings are recirculated back to the top of the spiral concentrators.

All the equipment in the flowchart is expected to fit on two or three 40-ft × 8-ft trailers. A throughput of 1.5 tons/hr of untreated soil is possible with relatively small equipment. The advantage of using physical separation to remediate lead-contaminated soils is the ability to recover large amounts of lead without the use of large volumes of extraction fluid. Very little lead is left in the soil that goes on to chemical treatment. Because the following chemical treatment is heap leaching, the use of wet separation is justified and the water added to the soil forms part of the extractant liquid.

The performance of the various stages in the separation scheme shown in Figure E-1 is given in Table E-5. Starting with 1.5 tons of contaminated soil, Table E-5 shows the distribution of the feed into various fractions and the amount of lead in each fraction. The "overall operation" columns show the product weight and lead content as percentages of their total values in the initial feed. The "unit operation" columns show the product weight and lead content as percentages of the feed to a particular unit process. The last two columns indicate the water balance maintained at various stages of the operation.

Table E-5. Performance of Separation Unit Processes for Lead Removal (Source: U.S. EPA, 1995, EPA/540/R-95/512)

Stream Number[a]	Dry Wt (ton)	Overall Operation: Soil Wt Dist (%)	Overall Operation: Pb Wt Dist (%)	Wt Pb in Stream (lb)	Stream Assay, Pb (%)	Unit Operation: Wt Dist (%)	Unit Operation: Pb Dist (%)	Percent Solids of Stream	Water (gpm)
Feed (a)	1.5	100	100	316.2	10.54	100	100	100	0
+3 (B)[b]	0.127	8.46	59.44	187.95	74.07	8.46	59.44	70	0.22
-3+20 (C)[c]	0.368	24.53	29.64	93.72	12.73	24.53	29.64	70	0.63
-20 (D)	1.005	67.01	10.92	34.53	1.72	67.01	10.92	25	12.05
JIG T (E)	0.22	14.68	0.03	0.09	0.036	59.84	0.1	10	7.92
JIG C (F)	0.148	9.85	29.61	93.63	31.67	40.16	99.9	60	0.39
CLS SAN (G)	0.7	46.66	6.38	20.17	1.44	69.63	58.43	75	0.93
CLS SLI (H)	0.305	20.35	4.54	14.36	2.35	30.37	41.57	9	12.33
SPRL C (I)	0.026	1.73	3.57	11.29	9.35	3.7	55.9	65	0.06
SPRL T (J)	0.674	44.93	2.81	8.89	0.283	96.3	44.1	23	9.02
TBL C (K)	0.002	0.13	2.98	9.42	80.8	7.5	83.5	40	0.01
TBL T (L)	0.024	1.6	0.59	1.87	1.3	92.5	16.5	5	1.82
BM C (M)	0.016	1.07	1.5	4.74	13.65	5.24	33.09	15	0.36
BM T (N)	0.289	19.28	3.04	9.61	1.53	94.76	66.91	6	18.1

(a) T = tailings; C = concentrate; CLS = classifier; SAN = sands; SLI = slimes; SPRL = spiral; TBL = table; BM = Bartles-Mozley Table. Letters following stream description indicate stream location on Figure E-1.

(b) +# = Retained on screen size #.

(c) -# = Passes through screen size #.

Interestingly, a simple screening step at 3 mesh results in 59.44% of the lead in the original feed being removed. A second screening step at 20 mesh (-3+20 mesh) removes another 29.64% of the lead in the original feed. Thus, almost 90% of the original lead contamination for the soil from this particular site is removed just by screening. Jigging concentrates the -3+20 mesh stream from the screen from 12.73% lead to 31.67% lead, making the material easier to sell to a recycler.

E.4 Commercial Processes

Several vendors, including COGNIS, Inc. (TerraMet™), Earth Treatment Technologies, Inc., and BESCORP have developed and commercialized acid leaching processes to recover lead from soils. These processes use an acid leachant to remove metals from the contaminated matrix and

are reported to treat most types of lead contamination, including metallic lead, soluble ions, and insoluble lead oxides and salts.

Physical separation is the first step in the commercial processes. Simple dry screening removes oversize materials. More complex physical separation can be used, if required. The contaminated fines are then processed by acid leaching. The fines are acid-leached by at least two contacts with fresh acid. The treated solids are then separated from the leaching solution. The spent leaching solution is treated by ion exchange or reduction to reeover lead and regenerate the leaching solution for reuse.

The BESCORP and COGNIS systems were used for full-scale remediation of about 20,000 tons of lead-contaminated soil at the Twin Cities Army Ammunition Plant, New Brighton, Minnesota. The average total lead concentration in the untreated soil was 17,000 mg/kg. The total lead residual in the treated soil was less than 300 mg/kg. The lead was recovered as part of solvent regeneration (Fix and Fristad, 1993; Lewis et al., 1995). The Earth Treatment Technologies system treated soils containing as high as 44,000 mg/kg of lead. The treated residual is reported to have contained less than 300 mg/kg and passed the TCLP test (DuGuay, 1993).

Physical separation followed by acid leaching has also been tested or applied for cleanup of metals-contaminated soils at Superfund sites. These tests are summarized in Table E-6.

Table E-6. Application Potential of Physical Separation Techniques to Waste Sites

Site	Application	Vendor/ Technology	Separation Equipment	Performance
Alaskan Battery Enterprise, Superfund Innovative Technology (SITE) demonstration	Soil contaminated by broken lead batteries	Brice Environmental Service Corp/ BESCORP Soil Washing System	Wet screen, hydraulic separators, spiral classifier, clarifier	61-85% lead removal; sand fraction passed TCLP test, gravel fraction failed TCLP test
Twin Cities Army Ammunition Plant, Minnesota, ordnance waste	Soil contaminated with lead from priming compound manufacturing waste	Brice Environmental Service Corp/ BESCORP Soil Washing System	Physical separation as pretreatment prior to chemical leaching	No data
Gould, Portland, Oregon, battery recycling site	Soil and battery casings contaminated with lead	Canonie Environmental	Attrition scrubbing, washing, gravity separation	lead concentration reduced from 100 to 200 mg/kg to ND to 5 mg/kg
United Scrap Lead, Ohio, battery recycling site	Soil and battery casings contaminated with lead	Canonie Environmental	Attrition scrubbing, washing, gravity separation	No data
Tonolli Corp., Pennsylvania, battery recycling site	Soil and battery casings contaminated with lead	Canonie Environmental	Attrition scrubbing, washing, gravity separation	No data

Sources: U.S. EPA, 1994, EPA/540/R-94/526 and U.S. EPA, 1994, EPA/542/R-94/003.

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Appendix F
Vendor 1 (Acetic Acid) Data

Table F-1. Vendor 1 (Acetic Acid Process) Data Summary

Sample No.	Process Stream	Analysis Type	Results				
			Units	Cu	Pb	Sb	Zn
C-SP04-FB	field blank	TCLP	ug/mL	0.000	0.000	0.008	0.288
		METALS	ug/g	3.57	3.28	0.000	4.02
C-SP12-Z	organic matter	TCLP	ug/mL	1.94	11.1	0.064	1.15
		METALS	ug/g	4,005	6,457	32.9	1,672
C-SP15-T	processed soil	TCLP	ug/mL	0.768	3.07	0.141	1.07
		METALS	ug/g	59.8	122	31.7	16.9
C-SP15-U	raw soil	TCLP	ug/mL	0.754	34.6	0.325	0.49
		METALS	ug/g	812	1854	105	72.2
C-SP15-L	leach circuit feed	TCLP	ug/mL	1.27	21.3	0.080	1.08
		METALS	ug/g	247	832	138	51.9
C-SP21-T (1)	processed soil	TCLP	ug/mL	1.78	5.99	0.067	0.662
		METALS	ug/g	99.0	208	44.1	18.7
C-SP21-U	raw soil	TCLP	ug/mL	1.00	21.0	0.132	0.442
		METALS	ug/g	1,516	1,407	89.3	168
C-SP25-T	processed soil	TCLP	ug/mL	7.01	10.3	0.012	2.46
		METALS	ug/g	215	330	54.5	32.2
C-SP25-U	raw soil	TCLP	ug/mL	0.736	22.0	0.233	0.448
		METALS	ug/g	1,525	3,347	180	127.1
C-OC02-C	coarse processed fraction	TCLP	ug/mL	16.4	6.49	0.038	2.37
		METALS	ug/g	415	252	38.5	50.8
C-OC02-T	processed soil	TCLP	ug/mL	7.08	11.2	0.057	1.96
		TCLP - pH 6	ug/mL	6.51	9.02	0.131	1.16
		TCLP - WW	ug/mL	6.51	8.79	0.042	0.878
		METALS	ug/g	359	404	91.8	45.4
C-OC02-U (1)	raw soil	TCLP	ug/mL	0.562	40.5	0.670	0.293
		METALS	ug/g	1,317	2741	139	103
C-OC02-F	fine processed fraction fraction from leach	TCLP	ug/mL	7.84	15.1	0.170	1.29
		METALS	ug/g	1,001	947	265	71.4
C-OC02-L (2)	leach circuit feed	TCLP	ug/mL	12.1	49.3	0.042	4.90
		METALS	ug/mL	704	5,347	259	120
C-OC02-Q	liquid from precipitation tank	METALS	ug/mL	21.5	627	5.08	39.2
C-OC03-M	metal concentrate from jig	TCLP	ug/mL	6.70	17.6	0.12	1.26
		METALS	ug/g	228	484	53.6	32.0
C-OC04-T	processed soil	TCLP	ug/mL	5.14	7.80	0.066	0.925
		TCLP - pH 6	ug/mL	4.09	6.40	0.069	0.669
		TCLP - WW	ug/mL	4.74	6.31	0.108	0.532
		METALS	ug/g	165	269	64.2	22.7
C-OC05-FB	field blank	TCLP	ug/mL	0.042	0.057	0.002	0.166
		METALS	ug/g	11.6	2.70	0.311	7.29
C-OC07-P	precipitate sludge	TCLP	ug/mL	0.000	321	0.105	9.38
		METALS	ug/g	2,438	11,990	457	348
C-OC07-Q	regenerated leachant	METALS	ug/mL	0.647	29.3	0.080	17.5
C-OC07-U	raw soil	+10 METALS	ug/g	267,800	491,900	21,000	18,500
C-OC10-T	processed soil	TCLP	ug/mL	10.9	21.7	0.142	2.29
		TCLP - pH 6	ug/mL	6.87	23.6	0.327	1.86
		TCLP - pH 8	ug/mL	6.41	15.8	0.263	1.11
		TCLP - pH 11	ug/mL	8.35	14.9	0.487	1.40
		TCLP - WW	ug/mL	9.58	17.8	0.111	1.33
		METALS	ug/g	797	839	171	65
C-OC11-U	raw soil	TCLP	ug/mL	3.30	106	0.671	0.572
		METALS	ug/g	1,943	4,789	219	159
C-OC11-O	oversize fraction	METALS	ug/g	100,332	184,292	7,868	6,931
C-OC12-P	precipitate sludge	TCLP	ug/mL	0.200	262	0.344	9.67
		METALS	ug/g	2,649	8,885	592	320
		DECANT	ug/mL	0.134	357	2.22	58.6
C-OC12-T	processed soil	TCLP	ug/mL	21.3	48.0	0.143	3.31
		METALS	ug/g	729	1,443	261	88.1

(1) +30 mesh data missing
(2) +30 mesh data missing or never existed

Table F-2. Total Metals Overall Result Calculations for Vendor 1 (Acetic Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
C-SP15-T-D1	2.4	7.5	-200	996.54	54.9	124	33.3	16.1
			+30	10.45	277.30	52.5	4.82	39.70
WEIGHTED AVG.					57.21	123.3	33.00	16.34
C-SP15-T-E1	2.5	2.4	-200	1091.36	62	121	30.8	16.4
			+30	15.42	85.8	70	8	94.7
WEIGHTED AVG.					62.33	120.3	30.48	17.49
OVERALL RESULT					**59.8**	**122**	**31.7**	**16.9**
C-SP15-U-D1	2.62	6.11	-200	1115.82	74.6	505	46.4	21.74
			+30	0.00				
WEIGHTED AVG.					74.60	505.0	46.40	21.74
C-SP15-U-E1	2.68	6.72	-200	1131.16	85.3	501	47.8	21.65
			+30	2.80	467	7170	232	44.5
WEIGHTED AVG.					86.24	517.5	48.25	21.71
			+10	313.30	267800	491900	21000	18500
AVG.	270	6.4	-10	114,320	80.42	511.23	47.33	21.72
OVERALL RESULT					**812**	**1854**	**104.6**	**72.2**
C-SP15-T-1X	2.3	5.22	-200	972.79	67.9	114	29.4	1.31
			+30	16.03	26.5	128.6	10.36	15.8
WEIGHTED AVG.					67.23	114.24	29.09	1.54
C-SP15-T-1Y	2.32	4.31	-200	993.56	72.5	117	24.3	1.94
			+30	13.44	20.5	106.8	9.59	13
WEIGHTED AVG.					71.81	116.86	24.10	2.09
C-SP15-T-1Z	2.22	3.6	-200	959.74	106	126	31.6	1.58
			+30	11.00	17.3	88.6	6.59	16.8
WEIGHTED AVG.					104.99	125.58	31.32	1.75
OVERALL RESULT					**81.3**	**119**	**28.2**	**1.79**
C-SP21-U-1D	2.38	9.24	-200	941.82	84	490	40.2	21.6
			+30	38.0	44728	7960	641	5123
WEIGHTED AVG.					1815.42	779.71	63.50	219.45
C-SP21-U-1E	2.42	9.09	-200	979.93	76	511	41.7	21.6
			+30	18.0	21418	7792	820	2370
WEIGHTED AVG.					460.95	642.33	55.74	63.96
			+10	140.60	267800	491900	21000	18500
AVG.	241	9.165	-10	99,158	1138.19	711.02	59.62	141.70
OVERALL RESULT					**1516**	**1407**	**89.3**	**168**
C-SP21-T-D1	2.92	0	-200	1292.39	106	223	47.2	20.2
			+30	32.12				
WEIGHTED AVG.								
C-SP21-T-E1	3.18	0	-200	1398.49	91.8	193	41	17.2
			+30	43.96				
WEIGHTED AVG.								
OVERALL RESULT					**98.9**	**208**	**44.1**	**18.7**
C-SP25-T-1D	2.96	1.35	-200	1323.83	217	325	54.7	32.8
			+30	0.70	193	482	17.4	35.3
WEIGHTED AVG.					216.99	325.08	54.68	32.80
C-SP25-T-1E	2.9	2.76	-200	1278.93	214	334	54.4	31.5
			+30	0.20	91.9	83.9	2.4	25.2
WEIGHTED AVG.					213.98	333.96	54.39	31.50
OVERALL RESULT					**215**	**330**	**54.5**	**32.2**

Table F-2. Total Metals Overall Result Calculations for Vendor 1 (Acetic Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
C-SP25-U-1D	3.08	0	-200	1388.09	88.6	645	65.6	26.6
			+30	9.00	2417	15307	668	245
WEIGHTED AVG.					103.60	739.45	69.48	28.01
C-SP25-U-1E	3.16	0	-200	1411.18	90.5	649	64	28.6
			+30	22.20	1209	6909	299	142
WEIGHTED AVG.					107.82	745.95	67.64	30.36
			+10	582.60	267800	491900	21000	18500
AVG.	262	7.55	-10	109,288	105.71	742.70	68.56	29.18
OVERALL RESULT					**1525**	**3347**	**180**	**127.1**
C-OC02-T-1D	3.22	0	-200	1459.59	360	407	91.2	47
			+30	1.00	371	66.6	12.3	40.6
WEIGHTED AVG.					360.01	406.77	91.15	47.00
C-OC02-T-1E	3.2	0	-200	1449.02	359	401	92.6	43.8
			+30	2.50	32.3	39.9	8.16	5.16
WEIGHTED AVG.					358.44	400.38	92.45	43.73
OVERALL RESULT					**359**	**404**	**91.8**	**45.4**
C-OC02-U-1D	3.16	0	-200	1427.38	81	458	45.7	19.4
			+30	6.00				
WEIGHTED AVG.					81.1	458.0	45.7	19.4
C-OC02-U-1E	3.16	0	-200	1423.35	71.6	440	36.8	16
			+30	10.02	2622	9496	566	224
WEIGHTED AVG.					89.43	502.83	40.50	17.31
			+10	458.70	267800	491900	21000	18500
AVG.	240	8.4	-10	99,261	85.24	480.42	43.08	18.35
OVERALL RESULT					**1317**	**2741**	**139**	**103.4**
C-OC02-F-1A	1.72	0	-200	715.69	1000.50	967.00	262.00	70.14
			+30	64.50	1006.00	722.00	299.00	85.20
OVERALL RESULT					**1001**	**947**	**265**	**71.4**
C-OC02-C-1D	3.15	0	-200	1428.34	415.00	252.00	38.55	50.85
			+30	0.50	118.00	57.00	4.84	24.80
OVERALL RESULT					**415**	**252**	**38.5**	**50.8**
C-OC03-M-1A	2.88	0	-200	1298.58	222	464	53.7	30.8
			+30	7.79	1260	3750	46.8	237.2
OVERALL RESULT					**228**	**484**	**53.6**	**32.0**
C-OC03-O-1A			+10	2.4	267800	491900	21000	18500
	202.0	14.1	-10	78,705	0	0	0	0
OVERALL RESULT					**8.2**	**15.0**	**0.640**	**0.564**
C-OC04-T-1D	3.28	0	-200	1486.21	168	273	64.6	23.2
			+30	1.60	788	807	330	75.8
WEIGHTED AVG.					169	274	64.9	23.3
C-OC04-T-1E	3.34	0	-200	1513.92	162	265	63.5	22.2
			+30	1.10	166	123	61.8	11.6
WEIGHTED AVG.					162	265	63.5	22.2
OVERALL RESULT					**165**	**269**	**64.2**	**22.7**
C-OC05-FB-1A	3.16	0	-200	1431	11.6	2.71	0.312	7.28
			+30	2.74	0.000	0.000	0.000	13.0
OVERALL RESULT					**11.6**	**2.70**	**0.311**	**7.29**

Table F-2. Total Metals Overall Result Calculations for Vendor 1 (Acetic Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
C-OC07-P-1A	3.02	60.93	-200	534	2440	12000	457	348
			+30	0.763	1060	4990	231	403
OVERALL RESULT					**2438**	**11990**	**457**	**348**
C-OC10-T-1A	2.94	0	-200	1312	765	843	166	65.4
			+30	21.1	2089	998	306	90.8
WEIGHTED AVG.					786	845	168	65.8
C-OC10-T-2A	2.92	0	-200	1294	777	828	170	64.0
			+30	30.5	2130	989	323	101
WEIGHTED AVG.					808	832	174	64.9
OVERALL RESULT					**797**	**839**	**171**	**65.3**
C-OC11-U-1D	2.22	7.21	-200	932	133	1575	88.1	30.8
			+30	2.20	12600	47500	1500	1250
WEIGHTED AVG.					163	1683	91	33.7
C-OC11-U-1E	2.38	0	-200	1071	168	1480	74	34.7
			+30	8.90	12600	12200	547	1329.5
WEIGHTED AVG.					270	1568	78	45.4
			+10	272	267800	491900	21000	18500
	100	7.2	-10	41,822	216	1626	84.5	39.5
OVERALL RESULT					**1943**	**4789**	**219**	**159**
C-OC11-O-1A			+10	3221	267800	491900	21000	18500
	19.6	3.2	-10	5,376	0.0	0.0	0.0	0.0
OVERALL RESULT					**100332**	**184292**	**7868**	**6931**
C-OC12-T-1A	6.41	0	-200	2882	765	1530	279	93.0
			+30	25.4	2206	5335	507	333
WEIGHTED AVG					778	1563	281	95.1
C-OC12-T-1B	6.41	0	-200	2896	676	1310	239	80.3
			+30	11.7	1737	4381	448	280
WEIGHTED AVG.					681	1322	240	81.1
OVERALL RESULT					**729**	**1443**	**261**	**88.1**

Equations Used for Calculations

1) $(\text{Dry Weight})_{-200\ \text{mesh}}$ (g) for Raw or Processed =
$[(\text{Composite Wt.} * (100 - \text{Moisture Content})/100) * (453.6)] - (\text{Dry Weight})_{+30\ \text{mesh}}$

2) $(\text{Dry Weight})_{+30\ \text{mesh}}$ (g) for Raw or Processed is a measured value from the lab.

3) $(\text{Dry Weight})_{-10\ \text{mesh}}$ (g) for Raw =
$[(\text{Composite Wt.} * (100 - \text{Moisture Content})/100) * (453.6)] - (\text{Dry Weight})_{+10\ \text{mesh}}$

4) Weighted Average = $[(\text{Dry Wt.} * \text{Conc.})_{-200\ \text{mesh}} + (\text{Dry Wt.} * \text{Conc.})_{+30\ \text{mesh}}]/(\text{Dry Wt.})_{-200\ \text{mesh} + (+30\ \text{mesh})}$

5) Processed Overall Result = $[(\text{Weighted Avg})_D + (\text{Weighted Avg})_E]/2$

6) Avg. = $(\text{Conc.})_{-10\ \text{mesh}} = [(\text{Weighted Avg})_D + (\text{Weighted Avg})_E]/2$

7) Raw Overall Result = $[(\text{Dry Wt.} * \text{Conc.})_{-10\ \text{mesh}} + (\text{Dry Wt.} * \text{Conc})_{+10\ \text{mesh}}]/(\text{Dry Wt.})_{+10\ \text{mesh} + (-10\ \text{mesh})}$

Table F-3. Operating Summary for Vendor 1 (Acetic Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	New (N) vs. Reprocessed (R) Soil	Feed Belt Operating Time (hrs)	Feed Rate (tons/hr)	Treated Belt Operating Time (hrs)	Down Time (hrs)	Process Streams Sampled for Offsite Analysis	Comments
9/3/96	1.0	1.0	N	1.0	1.0	1.5	7.5	none	First untreated soil was processed
9/4/96	1.0	2.0	N	1.0	1.0	1.5	7.5	none	
9/5/96	3.0	5.0	N	2.0	1.5	3.0	6.0	none	
9/6/96	8.5	13.5	N/R	4.0	2.1	5.0	4.0	none	
9/7/96	0.0	13.5	N/A	0.0	0.0	0.0	9.0	none	
9/8/96	0.0	13.5	N/A	0.0	0.0	0.0	SUN	none	
9/9/96	0.0	13.5	N/A	0.0	0.0	0.0	9.0	none	Dry sieve analysis of untreated soil performed
9/10/96	0.0	13.5	N/A	0.0	0.0	0.0	9.0	none	
9/11/96	0.0	13.5	N/A	0.0	0.0	0.0	9.0	none	
9/12/96	0.0	13.5	N/A	0.0	0.0	1.5	7.5	FB	Organic stream sampled and shipped
9/13/96	6.0	19.5	N/R	3.0	2.0	4.0	5.0	none	Some soil that was treated on 9/3/96 - 9/6/96 was reprocessed
9/14/96	6.0	25.5	N/R	3.0	2.0	4.0	5.0	none	Some soil that was treated on 9/3/96 - 9/6/96 was reprocessed
9/15/96	18.5	44.0	N	8.0	2.3	9.0	0.0	T,U,L	ContraCon estimated that 33 tons were processed
9/16/96	0.0	44.0	N/A	0.0	0.0	0.0	9.0	none	Wet sieve analysis of untreated soil performed
9/17/96	0.0	44.0	N/A	0.0	0.0	4.5	4.5	none	

Table F-3. Operating Summary for Vendor 1 (Acetic Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	New (N) vs. Reprocessed (R) Soil	Feed Belt Operating Time (hrs)	Feed Rate (tons/hr)	Treated Belt Operating Time (hrs)	Down Time (hrs)	Process Streams Sampled for Offsite Analysis	Comments
9/18/96	0.0	44.0	N/A	0.0	0.0	3.5	5.5	none	
9/19/96	2.0	46.0	N	1.0	2.0	3.5	5.5	none	Startup of 1000 ton test delayed due to rain
9/20/96	10.5	56.5	N	4.0	2.6	6.0	3.0	none	
9/21/96	12.8	69.3	N	7.0	1.8	9.0	0.0	T,U	Feed rates are so low soil samples will be collected over 2 days
9/22/96	0.0	69.3	N/A	0.0	0	0.0	SUN	none	
9/23/96	16.2	85.5	N	5.5	2.9	7.5	1.5	none	
9/24/96	0.0	85.5	N/A	0.0	0.0	9.0	0.0	none	Processing Time = Treat Belt Operating Time according to BDM and ContraCon
9/25/96	10.8	96.3	N	5.5	2.0	8.5	0.5	T,U	
9/26/96	9.8	106.1	N	5.5	1.8	8.5	0.5	none	
9/27/96	6.9	113.0	N	2.6	2.7	9.0	0.0	none	
9/28/96	0.0	113.0	N/A	0.0	0.0	0.0	9.0	none	Current vacuum press cannot handle the throughput of untreated soil; a new plate press has been ordered to raise the throughput
9/29/96	0.0	113.0	N/A	0.0	0.0	0.0	SUN	none	New plate press is being hooked up to the system
9/30/96	0.0	113.0	N/A	0.0	0.0	2.5	6.5	none	
10/1/96	17.9	130.9	N	4.5	4.0	9.0	0.0	none	
10/2/96	19.5	150.4	N	6.0	3.3	9.0	0.0	T,F,Q,C,L,U	

Table F-3. Operating Summary for Vendor 1 (Acetic Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	New (N) vs. Reprocessed (R) Soil	Feed Belt Operating Time (hrs)	Feed Rate (tons/hr)	Treated Belt Operating Time (hrs)	Down Time (hrs)	Process Streams Sampled for Offsite Analysis	Comments
10/3/96	27.0	177.4	R	4.5	6.0	10.0	1.0	M,O	Soil that has failed TCLP testing is being reprocessed; 58.5 tons of soil has been reprocessed to date
10/4/96	31.5	208.9	N/R	6.0	5.3	7.5	1.5	none	1.2 tons of new soil was fed to the system for 1/2 hour
10/5/96	14.4	223.3	N	4.0	3.6	9.0	0.0	none	
10/6/96	0.0	223.3	N/A	0.0	0.0	0.0	SUN	none	
10/7/96	14.0	237.3	N	4.5	3.1	9.0	0.0	Q,P	
10/8/96	0.0	237.3	N/A	0.0	0.0	8.0	1.0	none	New plate press is clogged; filter cloths will be replaced; old vacuum belt also clogged and must be replaced
10/9/96	0.0	237.3	N/A	0.0	0.0	0.0	9.0	none	
10/10/96	0.0	237.3	N/A	0.0	0.0	0.0	9.0	T (pH adj.)	
10/11/96	0.0	237.3	N/A	0.0	0.0	0.0	9.0	O	
10/12/96	14.9	252.2	N	6.5	2.3	6.5	2.5	P	
10/13/96	9.7	261.9	N	4.5	2.2	4.5	4.5	C,F	
Totals	-	**261.9**	-	**93.6**	**2.8**	**173.5**	**35.0**		

Table F-4. Utilities and Reagents Usage Summary for Vendor 1 (Acetic Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	Cumulative Power Used (kWH)	Cumulative Water Used (gal)	Cumulative Acetic Acid Used (gal)	Cumulative Lime Used (lbs)	Cumulative Thio-Red Used (gal)	Cumulative Flocculant Used (gal)	Comments
9/3/96	1.0	1.0	< 200	15000	35	0	0	0.4	System shakedown; note: the minimum increment on the power meter was 200 kWH
9/4/96	1.0	2.0	< 200	15000	70	0	0	0.8	
9/5/96	3.0	5.0	< 200	15000	175	0	0	2.1	
9/6/96	8.5	13.5	200	15500	473	0	55	5.6	
9/7/96	0.0	13.5	200	16200	473	0	55	5.6	
9/8/96	0.0	13.5	200	17000	473	0	110	5.6	
9/9/96	0.0	13.5	200	17800	473	0	110	5.6	
9/10/96	0.0	13.5	200	24000	473	0	110	5.6	
9/11/96	0.0	13.5	200	29500	473	0	110	5.6	
9/12/96	0.0	13.5	200	30100	473	0	110	5.6	
9/13/96	6.0	19.5	200	30750	683	0	135	8.2	
9/14/96	6.0	25.5	400	31500	893	0	135	10.7	
9/15/96	18.5	44.0	800	32250	1540	0	165	18.4	Pilot Test started
9/16/96	0.0	44.0	800	33900	1540	0	165	18.4	Awaiting TCLP and total metals results
9/17/96	0.0	44.0	1000	34600	1540	0	165	18.4	Awaiting TCLP and total metals results

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Table F-4. Utilities and Reagents Usage Summary for Vendor 1 (Acetic Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	Cumulative Power Used (kWH)	Cumulative Water Used (gal)	Cumulative Acetic Acid Used (gal)	Cumulative Lime Used (lbs)	Cumulative Thio-Red Used (gal)	Cumulative Flocculant Used (gal)	Comments
9/18/96	0.0	44.0	1000	35800	1540	0	165	18.4	Awaiting TCLP and total metals results
9/19/96	2.0	46.0	1000	36600	1610	1000	220	19.2	Pond was pH adjusted and emptied; awaiting TCLP and total metals results
9/20/96	10.5	56.5	1200	37500	1978	1000	220	23.6	Received TCLP and total metals results; passed TCLP and total metals criteria
9/21/96	12.8	69.3	1600	38600	2426	1000	275	29.0	
9/22/96	0.0	69.3	1600	38600	2426	1000	275	29.0	
9/23/96	16.2	85.5	2000	39350	2993	1000	305	35.7	
9/24/96	0.0	85.5	2200	40200	2993	1000	305	35.7	
9/25/96	10.8	96.3	2400	40450	3371	1750	330	40.3	
9/26/96	9.8	106.1	2800	40600	3714	1750	330	44.3	
9/27/96	6.9	113.0	3000	41550	3955	1800	365	47.2	
9/28/96	0.0	113.0	3000	42100	3955	1850	365	47.2	
9/29/96	0.0	113.0	3000	42100	3955	1850	365	47.2	
9/30/96	0.0	113.0	3000	42850	3955	2900	365	47.2	Pond was pH adjusted and emptied
10/1/96	17.9	130.9	3400	43550	4582	3000	385	54.7	
10/2/96	19.5	150.4	3800	44050	5264	3600	435	62.9	

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Table F-4. Utilities and Reagents Usage Summary for Vendor 1 (Acetic Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	Cumulative Power Used (kWH)	Cumulative Water Used (gal)	Cumulative Acetic Acid Used (gal)	Cumulative Lime Used (lbs)	Cumulative Thio-Red Used (gal)	Cumulative Flocculant Used (gal)	Comments
10/3/96	27.0	177.4	4200	44500	6209	3700	485	74.2	
10/4/96	32.7	210.1	4600	45400	7312	6500	550	87.8	Pond was pH adjusted and emptied
10/5/96	14.4	224.5	4800	46200	7858	6700	770	93.8	Thio-Red addition was quadrupled because lead in system water was too high
10/6/96	0.0	224.5	4800	46200	7858	6700	770	93.8	
10/7/96	13.9	238.4	5200	46950	8344	8400	770	99.7	Pond was pH adjusted and emptied
10/8/96	0.0	238.4	5400	47450	8344	8500	990	99.7	
10/9/96	0.0	238.4	5600	48250	8624	8600	990	99.7	
10/10/96	0.0	238.4	5600	49000	8624	9000	990	99.7	
10/11/96	0.0	238.4	5800	49700	8624	9000	990	99.7	
10/12/96	14.9	253.3	6000	50300	8939	9200	1100	105.9	
10/13/96	9.7	263.0	6200	51250	9415	9400	1210	109.9	
Totals	263.0	263.0	6200	51250	9415	9400	1210	109.9	

Table F-5. Onsite Samples Summary for Vendor 1 (Acetic Acid Process)

Date	Process Stream	Sample No.	Analysis Requested	Wet Wt./Vol. of Composite (lbs/L)	Moisture Content (%)	Minus 10 mesh soil dry weight (lbs)	Lead (g) in +10 mesh	Comments
9/10/96	FB	C-SP10-FB	TCLP/METALS	2 L	0.0	—	—	Field Blank sample collected by running clean sand through processing equipment.
9/12/96	Z	C-SP12-Z	TCLP/METALS	20 lbs.	—	—	—	Organic material screened out and collected in 55-gal. drums. Sample taken from drum.
9/15/96	T	C-SP15-T	TCLP/METALS	346 lbs.	45.7	—	—	Treated sample collected from the initial pilot test (Test = 18 tons processed).
9/15/96	U	C-SP15-U	TCLP/METALS	270 lbs.	6.4	252	313.3	Untreated sample collected from the soil delivered to pad on 9/3/96 - 9/4/96.
9/15/96	L	C-SP15-L	TCLP/METALS	79 lbs.	59.3	—	—	Sample collected from log washer basin; Feeds the leaching circuit.
9/21/96	T	C-SP21-T	TCLP/METALS	307 lbs.	—	—	—	Treated sample collected on 10/20/96 - 10/21/96
9/21/96	U	C-SP21-U	TCLP/METALS	241 lbs.	9.2	218.6	140.6	Untreated sample collected from the soil delivered to pad on 9/20/96 - 9/21/96.
9/25/96	T	C-SP25-T	TCLP/METALS	318 lbs.	—	—	—	Treated sample collected from runs on 9/23/96 - 9/25/96 On 9/24/96 only leached fines were discharged.
9/25/96	U	C-SP25-U	TCLP/METALS	262 lbs.	7.6	240.9	582.6	Untreated sample collected from the soil delivered to pad on 9/20/96 - 9/21/96.
10/2/96	T	C-OC02-T	TCLP/METALS	302 lbs.	—	—	—	Treated sample collected from runs on 10/1/96 - 10/2/96 from two separate piles.
10/2/96	U	C-OC02-U	TCLP/METALS	240 lbs.	8.4	239	458.7	Untreated sample collected from the soil delivered to pad on 9/20/96 - 9/21/96.
10/2/96	F	C-OC02-F	TCLP/METALS	23 lbs.	32.3	—	—	Collected sample of leach circuit output after it had been dewatered in the plate press.
10/2/96	C	COC02-C	TCLP/METALS	45 lbs.	11.8	—	—	Collected sample of sand screw (coarse) output after it has been dewatered in the small vacuum press.
10/2/96	L	COC02-L	TCLP/METALS	86 lbs.	42.1	—	—	Sample collected from the log washer basin. Feeds the leaching circuit. (Volume = 27 gal)
10/2/96	Q	C-OC02-Q	TCLP/METALS	2 L	liquid	—	—	Sample collected from the output pipe of Precipitation Tank (Inlet to clarifying tanks).
10/3/96	M	C-OC03-M	TCLP/METALS	111 lbs.	20.4	—	—	Sample taken from 55-gallon drum which collects the jig underflow.

Table F-5. Offsite Samples Summary for Vendor 1 (Acetic Acid Process)

Date	Process Stream	Sample No.	Analysis Requested	Wet Wt./Vol. of Composite (lbs/L)	Moisture Content (%)	Minus 10 mesh soil dry weight (lbs)	Lead (g) in +10 mesh	Comments
10/3/96	O	C-OC03-O	TCLP/METALS	202 lbs.	14.1	173.5	2.4	Sample taken from 55-gallon drum which collects [(+3/8") - (-1/2)"] from the screen deck.
10/5/96	FB	C-OC05-FB	TCLP/METALS	2 L	—	—	—	Field Blank sample collected by running clean sand through processing equipment.
10/7/96	Q	C-OC07-Q	TCLP/METALS	1 L	liquid	—	—	Sample collected from the output pipe of Precipitation Tank after large Thio-Red addition.
10/7/96	P	C-OC07-P	TCLP/METALS	2 L	60.9	—	—	Sample collected from Precipitation Tank by CNW. Sample 1/2 solids - 1/2 liquid.
10/10/96	T	C-OC10-T	TCLP/METALS	2 L	17.7	—	—	pH = 3.7; No neutralization to sample; 500 mL collected for water wash test.
10/10/96	T	C-OC10-T	TCLP	1 L	—	—	—	pH = 5.8; Neutralization Test; Additional sample given to M. Bricka.
10/10/96	T	C-OC10-T	TCLP	1L	—	—	—	pH = 7.6; Neutralization Test; Additional sample given to M. Bricka.
10/10/96	T	C-OC10-T	TCLP	1L	—	—	—	pH = 11.5; Neutralization Test; Additional sample given to M. Bricka.
10/11/96	U	C-OC11-U	TCLP/METALS	100 lbs.	7.2	92.2	271.6	Untreated soil sample collected from material delivered on 10/3/96 - 10/4/96
10/11/96	O	C-OC11-O	TCLP/METALS (Hand Sort)	19.58 lbs	3.2	11.9	3221	Samples came from log washer which was emptied on 10/10/96 - 10/11/96.
10/12/96	P	C-OC12-P	TCLP/METALS	2 L	55.6	—	—	Precipitate sample taken on 10/12/96; Collected directly from tank by R. Foyle.
10/12/96	C	C-OC12-C	TCLP/METALS	—	18.8	—	—	Samples combined with C-OC12-F to make sample C-OC13-T.
10/12/96	F	C-OC12-F	TCLP/METALS	—	48.4	—	—	Combined with C-OC12-C to make sample C-OC13-T

Table F-6. Laboratory Sample Preparation and Data for Vendor 1 (Acetic Acid Process)

Sample No.	Type Analysis	pH	Wet Wt. (lbs)	Dry Wt. (lbs)	Moisture Content	+30 Mesh Wt. (g)	Comments
C-SP04-FB-1A	TCLP	-	-	-	-	-	
C-SP04-FB-1B	TCLP	-	-	-	-	-	
C-SP04-FB-1D	Metals	-	3.27	3.27	0.00%	-	
C-SP12-Z-1A	TCLP/Metals	-	-	0.26	-	-	Organic
C-SP15-T-1A	TCLP	4.55	2.12	2.06	2.83%	-	Wet/Dry Sieve
C-SP15-T-1B	TCLP	4.37	2.26	2.20	2.65%	-	
C-SP15-T-1C	TCLP	4.55	2.26	2.20	2.65%	-	
C-SP15-T-1D	Metals	-	2.40	2.22	7.50%	10.45	
C-SP15-T-1E	Metals	-	2.5	2.44	2.40%	15.42	
C-SP15-T-1X	TCLP/Metals	-	2.30	2.18	5.22%	16.03	
C-SP15-T-1Y	TCLP/Metals	-	2.32	2.22	4.31%	13.44	
C-SP15-T-1Z	TCLP/Metals	-	2.22	2.14	3.60%	11.00	
C-SP15-U-A1	TCLP	4.00	2.44	2.28	6.56%	-	
C-SP15-U-B1	TCLP	-	2.44	2.22	9.02%	-	
C-SP15-U-C1	TCLP	-	2.34	2.10	10.26%	-	
C-SP15-U-D1	Metals	-	2.62	2.46	6.11%		
C-SP15-U-E1	Metals	-	2.68	2.50	6.72%	2.8	
C-SP15-L-A1	TCLP/Metals	4.38	2.80	1.14	59.29%	1.8	Wet Sieve +50,100,200
C-SP21-T-A1	TCLP	4.64	3.18	3.18	0.00%	-	
C-SP21-T-B1	TCLP	4.87	3.20	3.20	0.00%	-	
C-SP21-T-C1	TCLP	-	3.28	3.28	0.00%	-	
C-SP21-T-D1	Metals	-	2.92	2.92	0.00%	32.12	+50 = 32.12 grams
C-SP21-T-E1	Metals	-	3.18	3.18	0.00%	43.95	+50 = 43.95 grams
C-SP21-T-X1	TCLP	-	3.00	3.00	0.00%	-	
C-SP21-T-Y1	TCLP	-	2.92	2.92	0.00%	-	
C-SP21-T-Z1	TCLP	-	2.94	2.94	0.00%	-	
C-SP21-U-1A	TCLP	4.56	2.40	2.18	9.17%	-	
C-SP21-U-1B	TCLP	4.58	2.42	2.20	9.09%	-	
C-SP21-U-1C	TCLP	-	2.40	2.18	9.17%	-	
C-SP21-U-1D	Metals	-	2.38	2.16	9.24%	38	
C-SP21-U-1E	Metals	-	2.42	2.20	9.09%	18	
C-SP25-T-1A	TCLP	4.30	-	-	-	-	Start +30 and
C-SP25-T-1B	TCLP	4.22	-	-	-	-	1.2 lbs to -200
C-SP25-T-1C	TCLP	4.21	-	-	-	-	
C-SP25-T-1D	Metals	-	2.96	2.92	1.35%	0.7	
C-SP25-T-1E	Metals	-	2.90	2.82	2.76%	0.2	
C-SP25-U-1A	TCLP	-	3.20	2.96	7.50%	-	Use 3 media
C-SP25-U-1B	TCLP	-	3.38	3.10	8.28%	-	for grinding
C-SP25-U-1C	TCLP	-	3.20	2.98	6.88%	-	
C-SP25-U-1D	Metals	-	3.08	3.08	0.00%	9.0	
C-SP25-U-1E	Metals	-	3.16	3.16	0.00%	22.2	
C-OC02-T-1A	TCLP	4.13	-	-	-	-	
C-OC02-T-1B	TCLP	-	-	-	-	-	
C-OC02-T-1C	TCLP	-	-	-	-	-	
C-OC02-T-1D	Metals	-	3.22	3.22	0.00%	1	
C-OC02-T-1E	Metals	-	3.2	3.2	0.00%	2.5	
C-OC02-F-1A	TCLP/Metals	3.98	1.72	1.72	0.00%	64.5	
C-OC02-Q-1A	Metals	2.90	-	-	-	-	

- = Not Requested/Applicable

Table F-6. Laboratory Sample Preparation and Data for Vendor 1 (Acetic Acid Process)

Sample No.	Type Analysis	pH	Wet Wt. (lbs)	Dry Wt. (lbs)	Moisture Content	+30 Mesh Wt. (g)	Comments
C-OC02-L-1A	TCLP/Metals	-	1.95	1.13	42.05%		
C-OC02-C-1A	TCLP	4.90	-	-	-	-	
C-OC02-C-1B	TCLP	-	-	-	-	-	
C-OC02-C-1D	Metals	-	3.15	3.15	0.00%	0.5	
C-OC02-U-1A	TCLP	4.83	-	-	-	-	
C-OC02-U-1B	TCLP	-	-	-	-	-	
C-OC02-U-1D	Metals	-	3.16	3.16	0.00%	6	
C-OC02-U-1E	Metals	-	3.16	3.16	0.00%	10.1	
C-OC03-M-1A	TCLP/Metals	4.81	2.88	2.88	0.00%	7.8	
C-OC03-O-1A	Metals	5.17	3.12	3.02	3.21%	-	
C-OC04-T-1A	TCLP	-	-	-	-	-	
C-OC04-T-1B	TCLP	-	-	-	-	-	
C-OC04-T-1D	Metals	-	3.28	3.28	0.00%	1.6	
C-OC04-T-1E	Metals	-	3.34	3.34	0.00%	1.1	
C-OC05-FB-1A	TCLP/Metals	-	3.16	3.16	0.00%	-	
C-OC07-P-1A	TCLP/Metals	3.17	3.02	1.18	60.93%		
C-OC07-Q-1A	Metals	3.27	-	-	-	-	
C-OC07-U-1L	Metals (Contract)	-	1	1	0.00%	-	
C-OC10-T-1A	TCLP/Metals	-	2.94	2.94	0.00%	21.1	Baseline
C-OC10-T-2A	TCLP/Metals	-	2.92	2.92	0.00%	30.5	Baseline
C-OC10-T-3A	TCLP	4.75	-	-	-	-	Water Wash
C-OC10-T-1B	TCLP	5.80	-	-	-	-	pH = 6
C-OC10-T-1C	TCLP	7.50	-	-	-	-	pH = 8
C-OC10-T-1D	TCLP	11.5	-	-	-	-	pH = 11
C-OC11-O-1A	Hand Sort	-	-	-	-	-	
C-OC11-O-2A	Hand Sort	-	-	-	-	-	
C-OC11-O-3A	Hand Sort	-	-	-	-	-	
C-OC11-O-4A	Hand Sort	-	-	-	-	-	
C-OC11-U-1A	TCLP	-	-	-	-	-	
C-OC11-U-1B	TCLP	-	-	-	-	-	
C-OC11-U-1D	Metals	-	2.22	2.06	7.21%	2.2	
C-OC11-U-1E	Metals	-	2.38	2.38	0.00%	8.9	
C-OC11-U-1L	Metals (Contract)	-	269.8	269.8	0.00%	-	
C-OC12-P-1A	TCLP/Metals	3.57	1.08	0.48	55.56%		
C-OC12-C-1A	TCLP/Metals	5.47	11.72	9.52	18.77%	comments	+30 from combined and
C-OC12-C-2A	TCLP/Metals	-	-	-	-	comments	split samples: A = 25.4
C-OC12-C-3A	TCLP/Metals	-	-	-	-	comments	B = 11.7
C-OC12-F-1A	TCLP/Metals	4.32	6.4	3.3	48.44%	comments	
C-OC12-F-2A	TCLP/Metals	-	-	-	-	comments	

- = Not Requested/Applicable

Analytical Data

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-SP04-FB-1A	TCLP	100.4	µg/mL	0.000	0.000	0.008	1.15
C-SP04-FB-1A	TCLP	100.3	µg/mL	0.000	0.000	0.009	0.000
C-SP04-FB-1A Average			µg/mL	0.000	0.000	0.009	0.575
C-SP04-FB-1B	TCLP	100.1	µg/mL	0.000	0.000	0.000	0.000
C-SP04-FB-1B	TCLP	100.1	µg/mL	0.000	0.000	0.015	0.000
C-SP04-FB-1B Average			µg/mL	0.000	0.000	0.008	0.000
C-SP04-FB-1 Average	TCLP		µg/mL	0.000	0.000	0.008	0.288
Standard Deviation			µg/mL	0.000	0.000	0.001	0.407
Percent RSD				0.0%	0.00%	8.8%	141%
SP04-FB-1D	-200 TM	7.9364	µg/g	3.57	3.28	0.000	4.02
C-SP12-Z-1A	Organic - TCLP	100.1	µg/mL	1.94	11.1	0.064	1.15
C-SP12-Z-1A (1)	Organic - TM	2.0437	µg/g	3960	6370	33.6	1700
C-SP12-Z-1A (2)	Organic - TM	2.0004	µg/g	4320	6630	32.4	1760
C-SP12-Z-1A (3)	Organic - TM	2.0318	µg/g	3640	6230	32.0	1530
C-SP12-Z-1A (4)	Organic - TM	2.0013	µg/g	4100	6600	33.4	1700
C-SP12-Z-1A Average	Organic - TM		µg/g	4005	6457	32.9	1672
Standard Deviation			µg/g	285	191	0.774	99.1
Percent RSD				7.1%	3.0%	2.4%	5.9%
C-SP15-T-1A	TCLP	101.5	µg/mL	0.868	3.08	0.041	4.24
C-SP15-T-1A	TCLP	100.4	µg/mL	0.801	3.14	0.296	0.478
C-SP15-T-1A Average	TCLP		µg/mL	0.835	3.11	0.168	2.36
C-SP15-T-1B	TCLP	100.4	µg/mL	0.741	2.95	0.035	0.453
C-SP15-T-1B	TCLP	100.4	µg/mL	0.744	3.01	0.032	0.420
C-SP15-T-1B Average			µg/mL	0.743	2.98	0.034	0.436
C-SP15-T-1C	TCLP	100.2	µg/mL	0.726	3.10	0.414	0.421
C-SP15-T-1C	TCLP	102.0	µg/mL	0.726	3.10	0.030	0.406
C-SP15-T-1C Average			µg/mL	0.726	3.104	0.222	0.414
C-SP15-T-1 Average	TCLP		µg/mL	0.768	3.07	0.141	1.07
Standard Deviation			µg/mL	0.059	0.073	0.097	1.12
Percent RSD				7.6%	2.4%	69%	104%
C-SP15-T-1X	TCLP	100.7	µg/mL	0.697	3.19	0.060	0.393
C-SP15-T-1X	TCLP	100.5	µg/mL	0.688	3.16	0.070	0.791
C-SP15-T-1X Average	TCLP		µg/mL	0.693	3.18	0.065	0.592
C-SP15-T-1Y	TCLP	100.4	µg/mL	0.661	3.07	0.101	0.389
C-SP15-T-1Y	TCLP	100.5	µg/mL	0.683	3.01	0.067	1.74
C-SP15-T-1Y Average	TCLP		µg/mL	0.672	3.04	0.084	1.06
C-SP15-T-1Z	TCLP	101.2	µg/mL	0.662	3.02	0.057	0.994
C-SP15-T-1Z	TCLP	100.4	µg/mL	0.629	3.00	0.068	0.371
C-SP15-T-1Z Average	TCLP		µg/mL	0.646	3.01	0.063	0.683
C-SP15-T-1 Average	TCLP		µg/mL	0.670	3.08	0.071	0.780
Standard Deviation			µg/mL	0.024	0.088	0.012	0.25
Percent RSD				3.5%	2.9%	17%	32%
C-SP15-T-1D	-200 TM	8.0279	µg/g	55.4	125	33.2	16.2
C-SP15-T-1D	-200 TM	7.9761	µg/g	54.4	123	33.4	15.9
C-SP15-T-1D Average	-200 TM		µg/g	54.9	124	33.3	16.1
C-SP15-T-1E	-200 TM	7.9851	µg/g	61.5	121	31.1	16.4
C-SP15-T-1E	-200 TM	7.9571	µg/g	62.4	121	30.5	16.3
C-SP15-T-1E Average	-200 TM		µg/g	62.0	121	30.8	16.4
C-SP15-T-1 Average	-200 TM		µg/g	58.4	122	32.1	16.2

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Standard Deviation			**µg/g**	**4.99**	**2.02**	**1.77**	**0.212**
Percent RSD				**8.5%**	**1.6%**	**5.5%**	**1.3%**
C-SP15-T-1X	-200 TM	8.0319	µg/g	67.4	112	28.7	1.30
C-SP15-T-1X	-200 TM	7.9996	µg/g	68.3	115	30.1	1.31
C-SP15-T-1X Average	-200 TM		µg/g	67.9	114	29.4	1.31
C-SP15-T-1Y	-200 TM	8.0508	µg/g	74.3	118	17.4	2.55
C-SP15-T-1Y	-200 TM	8.0505	µg/g	70.7	116	31.1	1.32
C-SP15-T-1Y Average	-200 TM		µg/g	72.5	117	24.3	1.94
C-SP15-T-1Z	-200 TM	8.1139	µg/g	104	125	31.7	1.57
C-SP15-T-1Z	-200 TM	8.0755	µg/g	108	126	31.4	1.58
C-SP15-T-1Z Average	-200 TM		µg/g	106	126	31.6	1.58
C-SP15-T-1 Average	**-200 TM**		**µg/g**	**82.1**	**119**	**28.4**	**1.61**
Standard Deviation			**µg/g**	**20.8**	**6.17**	**3.75**	**0.316**
Percent RSD				**25%**	**5.2%**	**13%**	**20%**
C-SP15-U-1A	TCLP	100.1	µg/mL	1.76	22.1	0.152	1.45
C-SP15-U-1A	TCLP	100.8	µg/mL	0.659	58.7	0.407	0.220
C-SP15-U-1A Average			µg/mL	1.21	40.4	0.279	0.835
C-SP15-U-1B	TCLP	100.6	µg/mL	0.673	30.9	0.107	0.190
C-SP15-U-1B	TCLP	100.8	µg/mL	0.493	11.6	0.051	0.179
C-SP15-U-1B Average			µg/mL	0.583	21.2	0.079	0.185
C-SP15-U-1C	TCLP	100.3	µg/mL	0.516	37.6	0.466	0.723
C-SP15-U-1C	TCLP	100.6	µg/mL	0.419	47.0	0.770	0.177
C-SP15-U-1C Average			µg/mL	0.468	42.3	0.618	0.450
C-SP15-U-1 Average	**TCLP**		**µg/mL**	**0.754**	**34.6**	**0.325**	**0.490**
Standard Deviation			**µg/mL**	**0.400**	**11.6**	**0.272**	**0.327**
Percent RSD				**53%**	**34%**	**84%**	**67%**
C-SP15-U-1D	-200 TM	8.0089	µg/g	75.3	507	47.9	21.9
C-SP15-U-1D	-200 TM	7.9970	µg/g	73.8	502	44.9	21.6
C-SP15-U-1D Average	-200 TM		µg/g	74.6	505	46.4	21.7
C-SP15-U-1E	-200 TM	8.0496	µg/g	86.0	505	48.2	21.9
C-SP15-U-1E	-200 TM	8.0149	µg/g	84.5	498	47.4	21.4
C-SP15-U-1E Average	-200 TM		µg/g	85.3	501	47.8	21.7
C-SP15-U-1 Average	**-200 TM**		**µg/g**	**79.9**	**503**	**47.1**	**21.7**
Standard Deviation			**µg/g**	**7.56**	**2.45**	**0.99**	**0.061**
Percent RSD				**9.5%**	**0.49%**	**2.1%**	**0.3%**
C-SP15-U-1E	**+30 TM**	**2.8230**	**µg/g**	**467**	**7170**	**232**	**44.6**
C-SP15-L-1A	**TCLP**	**101.7**	**µg/mL**	**1.77**	**21.3**	**0.080**	**1.08**
C-SP15-L-1A	Leach - TM	8.3036	µg/g	244	829	139	51.4
C-SP15-L-1A	Leach - TM	8.2016	µg/g	250	835	138	52.4
C-SP15-L-1 Average	**Leach - TM**		**µg/g**	**247**	**832**	**138**	**51.9**
Standard Deviation			**µg/g**	**4.22**	**4.70**	**1.26**	**0.73**
Percent RSD				**1.7%**	**0.6%**	**0.9%**	**1.4%**
C-SP15-T-1D (1)	+30 TM	5.3520	µg/g	479	56.9	4.18	57.3
C-SP15-T-1D (2)	+30 TM	5.0728	µg/g	64.6	47.8	5.50	21.2
C-SP15-T-1D Weighted Average	+30 TM		µg/g	277	52.5	4.82	39.7
C-SP15-T-1E (1)	+30 TM	7.7019	µg/g	16.4	71.1	7.80	19.8
C-SP15-T-1E (2)	+30 TM	8.0817	µg/g	152	69.0	8.19	166
C-SP15-T-1E Weighted Average	+30 TM		µg/g	85.8	70.0	8.00	94.7
C-SP15-T-1 Average	**+30 TM**		**µg/g**	**182**	**61.2**	**6.41**	**67.2**

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Standard Deviation			µg/g	135	12.4	2.25	38.8
Percent RSD				75%	20%	35%	58%
C-SP15-T-1X (1)	+30 TM	8.0690	µg/g	17.6	86.0	7.08	13.0
C-SP15-T-1X (2)	+30 TM	7.9383	µg/g	35.5	172	13.7	18.6
C-SP15-T-1X Weighted Average	+30 TM		µg/g	26.5	129	10.4	15.8
C-SP15-T-1Y (1)	+30 TM	6.6212	µg/g	30.1	157	13.6	15.1
C-SP15-T-1Y (2)	+30 TM	6.7952	µg/g	11.2	57.9	5.69	11.0
C-SP15-T-1Y Weighted Average	+30 TM		µg/g	20.5	107	9.59	13.0
C-SP15-T-1Z (1)	+30 TM	5.5155	µg/g	25.9	135	7.53	16.7
C-SP15-T-1Z (2)	+30 TM	5.4756	µg/g	8.56	41.9	5.64	17.0
C-SP15-T-1Z Weighted Average	+30 TM			17.3	88.6	6.59	16.8
C-SP15-T-1 Average	+30 TM		µg/g	21.4	108	8.85	15.2
Standard Deviation			µg/g	4.67	20.0	1.99	1.97
Percent RSD				22%	19%	23%	13%
C-SP21-T-1A	TCLP	100.2	µg/mL	1.79	5.92	0.068	0.376
C-SP21-T-1A	TCLP	100.0	µg/mL	1.81	5.86	0.074	1.04
C-SP21-T-1A Average	TCLP		µg/mL	1.80	5.89	0.071	0.709
C-SP21-T-1B	TCLP	100.2	µg/mL	1.99	6.02	0.074	0.418
C-SP21-T-1B	TCLP	100.3	µg/mL	1.88	6.28	0.044	0.930
C-SP21-T-1B Average	TCLP		µg/mL	1.93	6.15	0.059	0.674
C-SP21-T-1C	TCLP	100.3	µg/mL	1.63	6.02	0.072	0.805
C-SP21-T-1C	TCLP	100.7	µg/mL	1.58	5.82	0.072	0.401
C-SP21-T-1C Average	TCLP		µg/mL	1.61	5.92	0.072	0.603
C-SP21-T-1 Average	TCLP		µg/mL	1.78	5.99	0.067	0.662
Standard Deviation			µg/mL	0.164	0.143	0.007	0.054
Percent RSD				9.2%	2.4%	11%	8.2%
C-SP21-T-1D	-200 TM	8.0726	µg/g	105	221	47.2	20.4
C-SP21-T-1D	-200 TM	8.0940	µg/g	107	224	47.1	20.1
C-SP21-T-1D Average	-200 TM		µg/g	106	223	47.2	20.2
C-SP21-T-1E	-200 TM	8.2876	µg/g	91.2	192	41.2	17.1
C-SP21-T-1E	-200 TM	8.1747	µg/g	92.4	194	40.9	17.3
C-SP21-T-1E Average	-200 TM		µg/g	91.8	193	41.0	17.2
C-SP21-T-1 Average	-200 TM		µg/g	99.0	208	44.1	18.7
Standard Deviation			µg/g	10.1	20.9	4.35	2.13
Percent RSD				10%	10%	9.9%	11%
C-SP21-T-1X	TCLP	100.1	µg/mL	1.93	7.37	0.080	0.526
C-SP21-T-1X	TCLP	100.4	µg/mL	1.85	6.68	0.064	1.90
C-SP21-T-1X Average	TCLP		µg/mL	1.89	7.03	0.072	1.21
C-SP21-T-1Y	TCLP	100.5	µg/mL	1.78	6.47	0.049	0.948
C-SP21-T-1Y	TCLP	100.1	µg/mL	1.77	6.43	0.064	0.470
C-SP21-T-1Y Average	TCLP		µg/mL	1.78	6.45	0.057	0.709
C-SP21-T-1Z	TCLP	100.2	µg/mL	1.71	6.02	0.076	0.870
C-SP21-T-1Z	TCLP	100.5	µg/mL	1.67	5.98	0.072	0.439
C-SP21-T-1Z Average	TCLP		µg/mL	1.69	6.00	0.074	0.655
C-SP21-T-1 Average	TCLP		µg/mL	1.78	6.49	0.068	0.859
Standard Deviation			µg/mL	0.100	0.515	0.010	0.307
Percent RSD				5.6%	7.9%	14%	36%
C-SP21-U-1A	TCLP	100.8	µg/mL	0.830	21.8	0.221	0.217
C-SP21-U-1A	TCLP	101.4	µg/mL	0.480	18.7	0.070	0.638

Fort Polk Data Results
Summary

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
-SP21-U-1A Average	TCLP		µg/mL	0.655	20.3	0.146	0.428
-SP21-U-1B	TCLP	101.2	µg/mL	0.419	14.5	0.084	0.209
-SP21-U-1B	TCLP	100.6	µg/mL	0.505	29.7	0.232	0.620
-SP21-U-1B Average	TCLP		µg/mL	0.462	22.1	0.158	0.415
-SP21-U-1C	TCLP	101.4	µg/mL	1.97	17.3	0.096	0.658
-SP21-U-1C	TCLP	100.1	µg/mL	1.80	23.7	0.089	0.311
-SP21-U-1C Average	TCLP		µg/mL	1.89	20.5	0.093	0.485
-SP21-U-1 Average	**TCLP**		**µg/mL**	**1.00**	**21.0**	**0.132**	**0.442**
tandard Deviation			**µg/mL**	**0.772**	**1.008**	**0.035**	**0.037**
ercent RSD				**77.1%**	**4.8%**	**26%**	**8%**
-SP21-U-1D	-200 TM	8.1610	µg/g	95.1	571	47.2	25.0
-SP21-U-1D	-200 TM	8.1059	µg/g	73.2	408	33.2	18.3
-SP21-U-1D Average	-200 TM		µg/g	84.1	490	40.2	21.6
-SP21-U-1E	-200 TM	8.2839	µg/g	74.5	511	42.3	21.4
-SP21-U-1E	-200 TM	8.1830	µg/g	77.1	511	41.2	21.9
-SP21-U-1E Average	-200 TM		µg/g	75.8	511	41.7	21.6
-SP21-U-1 Average	**-200 TM**		**µg/g**	**80.0**	**500**	**40.9**	**21.6**
tandard Deviation			**µg/g**	**5.9**	**14.9**	**1.09**	**0.00**
ercent RSD				**7.4%**	**3.0%**	**2.7%**	**0.0%**
-SP21-U-1D (1)	+30 TM	8.2894	µg/g	36700	5030	282	4020
-SP21-U-1D (2)	+30 TM	8.0724	µg/g	11547	6999	102	1828
-SP21-U-1D (3)	+30 TM	8.2050	µg/g	109287	7087	208	12212
-SP21-U-1D (4)	+30 TM	4.6908	µg/g	3092	16319	2958	344
-SP21-U-1D Weighted Average	**+30 TM**		**µg/g**	**44728**	**7960**	**641**	**5123**
-SP21-U-1E (1)	+30 TM	8.0758	µg/g	14400	2850	363	1450
-SP21-U-1E (2)	+30 TM	9.9248	µg/g	27129	11814	1192	3118
-SP21-U-1E Weighted Average	**+30 TM**		**µg/g**	**21418**	**7792**	**820**	**2370**
-SP25-T-1A	TCLP	100.2	µg/mL	6.84	10.1	0.025	1.14
-SP25-T-1A	TCLP	100.8	µg/mL	7.08	10.4	0.024	3.81
-SP25-T-1A Average	TCLP		µg/mL	6.96	10.2	0.025	2.47
-SP25-T-1B	TCLP	100.6	µg/mL	7.01	10.1	0.013	5.91
-SP25-T-1B	TCLP	100.8	µg/mL	7.11	10.4	0.000	1.35
-SP25-T-1B Average	TCLP		µg/mL	7.06	10.3	0.006	3.63
-SP25-T-1C	TCLP	100.3	µg/mL	6.88	10.1	0.009	1.24
-SP25-T-1C	TCLP	100.6	µg/mL	7.11	10.4	0.003	1.30
-SP25-T-1C Average	TCLP		µg/mL	7.00	10.3	0.006	1.27
-SP25-T-1 Average	**TCLP**		**µg/mL**	**7.01**	**10.3**	**0.012**	**2.46**
tandard Deviation			**µg/mL**	**0.051**	**0.018**	**0.011**	**1.18**
ercent RSD				**0.7%**	**0.2%**	**85%**	**48%**
-SP25-T-1D	-200 TM	8.2463	µg/g	218	326	55.0	33.3
-SP25-T-1D	-200 TM	8.3083	µg/g	216	324	54.4	32.4
-SP25-T-1D Average	-200 TM		µg/g	217	325	54.7	32.8
-SP25-T-1E	-200 TM	8.1410	µg/g	208	325	53.8	30.7
-SP25-T-1E	-200 TM	8.2106	µg/g	219	344	55.1	32.4
-SP25-T-1E Average	-200 TM		µg/g	214	334	54.4	31.5
-SP25-T-1 Average	**-200 TM**		**µg/g**	**215**	**330**	**54.6**	**32.2**
tandard Deviation			**µg/g**	**2.67**	**6.37**	**0.197**	**0.918**
ercent RSD				**1.2%**	**1.9%**	**0.36%**	**2.9%**
-SP25-T-1D	**+30 TM**	**0.6572**	**µg/g**	**193**	**482**	**17.4**	**35.3**

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-SP25-T-1E	**+30 TM**	**0.2502**	**µg/g**	**91.9**	**83.9**	**2.40**	**25.2**
C-SP25-U-1A	TCLP	101.0	µg/mL	0.416	14.7	0.070	0.184
C-SP25-U-1A	TCLP	100.2	µg/mL	0.492	27.9	0.241	1.38
C-SP25-U-1A Average	TCLP		µg/mL	0.454	21.3	0.156	0.782
C-SP25-U-1B	TCLP	101.2	µg/mL	2.21	51.1	0.785	0.216
C-SP25-U-1B	TCLP	100.9	µg/mL	0.360	12.2	0.072	0.159
C-SP25-U-1B Average	TCLP		µg/mL	1.29	31.7	0.429	0.188
C-SP25-U-1C	TCLP	101.7	µg/mL	0.550	16.1	0.184	0.544
C-SP25-U-1C	TCLP	101.1	µg/mL	0.386	10.0	0.046	0.207
C-SP25-U-1C Average	TCLP		µg/mL	0.468	13.1	0.115	0.376
C-SP25-U-1 Average	**TCLP**		**µg/mL**	**0.736**	**22.0**	**0.233**	**0.448**
Standard Deviation			**µg/mL**	**0.476**	**9.32**	**0.171**	**0.304**
Percent RSD				**65%**	**42%**	**73%**	**68%**
C-SP25-U-1D	-200 TM	8.1455	µg/g	87.9	643	64.8	26.3
C-SP25-U-1D	-200 TM	8.1757	µg/g	89.3	646	66.4	26.9
C-SP25-U-1D Average	-200 TM		µg/g	88.6	645	65.6	26.6
C-SP25-U-1E	-200 TM	8.1242	µg/g	86.0	623	62.7	27.3
C-SP25-U-1E	-200 TM	8.2112	µg/g	95.0	676	65.4	29.8
C-SP25-U-1E Average	-200 TM		µg/g	90.5	649	64.0	28.6
C-SP25-U-1 Average	**-200 TM**		**µg/g**	**89.6**	**647**	**64.8**	**27.6**
Standard Deviation			**µg/g**	**1.36**	**3.40**	**1.127**	**1.408**
Percent RSD				**1.5%**	**0.5%**	**1.74%**	**5.1%**
C-SP25-U-1D (1)	+30 TM	8.1708	µg/g	2580	17000	745	261
C-SP25-U-1D (2)	+30 TM	0.9425	µg/g	1004	628	1.91	110
C-SP25-U-1D Weighted Average	**+30 TM**		**µg/g**	**2417**	**15307**	**668**	**245**
C-SP25-U-1E (1)	+30 TM	8.0645	µg/g	1210	6200	260	154
C-SP25-U-1E (2)	+30 TM	9.4876	µg/g	1356	7958	364	152
C-SP25-U-1E (3)	+30 TM	4.5697	µg/g	904	5981	231	101
C-SP25-U-1E Weighted Average	**+30 TM**		**µg/g**	**1209**	**6909**	**299**	**142**
C-OC02-T-1A	TCLP	101.0	µg/mL	6.70	10.8	0.098	4.16
C-OC02-T-1A	TCLP	101.1	µg/mL	7.24	10.9	0.044	1.43
C-OC02-T-1A Average	TCLP		µg/mL	6.97	10.9	0.071	2.80
C-OC02-T-1B	TCLP	100.4	µg/mL	6.74	11.2	0.022	1.36
C-OC02-T-1B	TCLP	100.3	µg/mL	6.87	11.0	0.050	1.87
C-OC02-T-1B Average	TCLP		µg/mL	6.81	11.1	0.036	1.62
C-OC02-T-1C	TCLP	101.5	µg/mL	7.20	11.6	0.053	1.55
C-OC02-T-1C	TCLP	100.9	µg/mL	7.75	11.7	0.072	1.38
C-OC02-T-1C Average	TCLP		µg/mL	7.47	11.6	0.063	1.46
C-OC02-T-1 Average	**TCLP**		**µg/mL**	**7.08**	**11.2**	**0.057**	**1.96**
Standard Deviation			**µg/mL**	**0.348**	**0.400**	**0.018**	**0.73**
Percent RSD				**4.9%**	**3.6%**	**32%**	**37%**
C-OC02-T-1D	-200 TM	8.3830	µg/g	353	399	89.0	46.1
C-OC02-T-1D	-200 TM	8.2599	µg/g	367	415	93.4	47.9
C-OC02-T-1D Average	-200 TM		µg/g	360	407	91.2	47.0
C-OC02-T-1E	-200 TM	8.2571	µg/g	349	390	91.6	42.6
C-OC02-T-1E	-200 TM	8.1989	µg/g	369	413	93.6	45.1
C-OC02-T-1E Average	-200 TM		µg/g	359	401	92.6	43.8
C-OC02-T-1 Average	**-200 TM**		**µg/g**	**360**	**404**	**91.9**	**45.4**
Standard Deviation			**µg/g**	**0.61**	**3.90**	**0.965**	**2.245**

Fort Polk Data Results
Summary

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
ercent RSD				0.2%	1.0%	1.05%	4.9%
-OC02-T-1D	+30 TM	0.9764	µg/g	371	66.6	12.3	40.6
-OC02-T-1E	+30 TM	7.5134	µg/g	32.3	39.9	8.16	5.16
-OC02-U-1A	TCLP	102.0	µg/mL	0.430	7.99	0.032	0.388
-OC02-U-1A	TCLP	101.1	µg/mL	0.446	9.92	0.028	0.228
-OC02-U-1A Average	TCLP		µg/mL	0.438	8.96	0.030	0.308
-OC02-U-1B	TCLP	100.1	µg/mL	0.838	111	2.17	0.263
-OC02-U-1B	TCLP	100.6	µg/mL	0.532	32.9	0.449	0.294
-OC02-U-1B Average	TCLP		µg/mL	0.685	72.0	1.31	0.278
-OC02-U-1 Average	TCLP		µg/mL	0.562	40.5	0.670	0.293
tandard Deviation			µg/mL	0.175	44.6	0.906	0.021
ercent RSD				31%	110%	135%	7.2%
-OC02-U-1D	-200 TM	8.0291	µg/g	82.1	457	45.1	19.9
-OC02-U-1D	-200 TM	8.0204	µg/g	80.0	459	46.2	18.9
-OC02-U-1D Average	-200 TM		µg/g	81.0	458	45.6	19.4
tandard Deviation			µg/g	1.47	1.23	0.828	0.704
ercent RSD				1.8%	0.27%	1.8%	3.6%
-OC02-U-1E	-200 TM	7.9560	µg/g	71.5	447	37.2	10.5
-OC02-U-1E	-200 TM	8.1622	µg/g	71.7	432	36.4	21.2
-OC02-U-1E Average	-200 TM		µg/g	71.6	440	36.8	15.9
tandard Deviation			µg/g	0.161	10.2	0.578	7.59
ercent RSD				0.23%	2.3%	1.6%	48%
-OC02-U-1E (1)	+30 TM	8.1255	µg/g	2520	9610	546	208
-OC02-U-1E (2)	+30 TM	1.8979	µg/g	3060	9010	648	293
-OC02-U-1E Weighted Average	+30 TM		µg/g	2622	9496	566	224
-OC02-F-1A	TCLP	100.5	µg/mL	7.73	15.2	0.168	1.18
-OC02-F-1A	TCLP	100.2	µg/mL	7.94	15.0	0.173	1.40
-OC02-F-1A Average	TCLP		µg/mL	7.84	15.10	0.17	1.29
tandard Deviation			µg/mL	0.148	0.141	0.004	0.156
ercent RSD				1.9%	0.94%	2.1%	12.1%
-OC02-F-1A	-200 TM	8.1482	µg/g	1020	982	264	66.7
-OC02-F-1A	-200 TM	7.6230	µg/g	980	952	260	73.5
-OC02-F-1A Average	-200 TM		µg/g	1000	967	262	70.1
tandard Deviation			µg/g	28.3	21.2	2.83	4.81
ercent RSD				2.8%	2.2%	1.1%	6.9%
-OC02-F-1A (1)	+30 TM	8.1839	µg/g	961	807	240	91.3
-OC02-F-1A (2)	+30 TM	9.0296	µg/g	1036	732	304	86.6
-OC02-F-1A (3)	+30 TM	8.7067	µg/g	1004	722	301	84.2
-OC02-F-1A (4)	+30 TM	8.0148	µg/g	999	705	322	84.9
-OC02-F-1A (5)	+30 TM	8.6064	µg/g	1064	702	305	82.4
-OC02-F-1A (6)	+30 TM	8.6508	µg/g	975	689	306	84.8
-OC02-F-1A (7)	+30 TM	8.1754	µg/g	1024	680	304	79.8
-OC02-F-1A (8)	+30 TM	5.6233	µg/g	968	744	318	88.7
-OC02-F-1A Weighted Average	+30 TM		µg/g	1006	722	299	85.2
-OC02-Q-1A (1)	TM		µg/mL	21.6	631	5.46	39.5
-OC02-Q-1A (2)	TM		µg/mL	21.4	622	4.70	38.9
-OC02-Q-1A Average	TM		µg/mL	21.5	627	5.08	39.2
tandard Deviation			µg/mL	0.156	6.36	0.537	0.368
ercent RSD				0.72%	1.0%	11%	0.94%

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-OC02-C-1A	TCLP	100.2	µg/mL	18.2	6.97	0.030	2.59
C-OC02-C-1A	TCLP	100.6	µg/mL	16.1	6.32	0.053	2.30
C-OC02-C-1A Average	TCLP		µg/mL	17.1	6.65	0.041	2.45
C-OC02-C-1B	TCLP	100.6	µg/mL	16.1	6.64	0.023	2.42
C-OC02-C-1B	TCLP	100.3	µg/mL	15.1	6.02	0.046	2.18
C-OC02-C-1B Average	TCLP		µg/mL	15.6	6.33	0.034	2.30
C-OC02-C-1 Average	TCLP		µg/mL	16.4	6.49	0.038	2.37
Standard Deviation			µg/mL	1.08	0.22	0.005	0.103
Percent RSD				6.6%	3.4%	13.50%	4.4%
C-OC02-C-1D	-200 TM	8.1838	µg/g	421	256	41.0	51.4
C-OC02-C-1D	-200 TM	8.2905	µg/g	409	248	36.1	50.3
C-OC02-C-1D Average	-200 TM		µg/g	415	252	38.6	50.9
Standard Deviation			µg/g	8.49	5.66	3.46	0.778
Percent RSD				2.0%	2.2%	9.0%	1.5%
C-OC02-C-1D	+30 TM	0.5224	µg/g	118	57.0	4.84	24.8
C-OC02-T-1C WW	TCLP	100.7	µg/mL	6.82	8.94	0.048	0.972
C-OC02-T-1C WW	TCLP	101.5	µg/mL	6.21	8.63	0.035	0.784
C-OC02-T-1C WW Average			µg/g	6.51	8.79	0.042	0.878
Standard Deviation			µg/g	0.430	0.216	0.009	0.133
Percent RSD				6.6%	2.4%	21%	15%
C-OC02-T-1C pH 5.90	TCLP	100.0	µg/mL	5.86	8.45	0.148	1.18
C-OC02-T-1C pH 6.00	TCLP	100.7	µg/mL	7.16	9.59	0.114	1.14
C-OC02-T-1C pH 6 Average			µg/g	6.51	9.02	0.131	1.16
Standard Deviation			µg/g	0.919	0.808	0.024	0.025
Percent RSD				14%	9.0%	18%	2.1%
C-OCO2-L-1A	TCLP	100.6	µg/mL	10.5	42.5	0.032	4.25
C-OCO2-L-1A	TCLP	101.7	µg/mL	13.7	56.1	0.052	5.56
C-OC02-L-1A Average	TCLP		µg/mL	12.1	49.3	0.04	4.90
Standard Deviation			µg/mL	2.23	9.62	0.015	0.928
Percent RSD				18%	19%	35%	19%
C-OC02-L-1A	-200 TM	8.0297	µg/g	709	1663	231	122
C-OC02-L-1A	-200 TM	8.1519	µg/g	709	1684	288	122
C-OC02-L-1A Average	-200 TM		µg/g	709	1673	260	122
Standard Deviation			µg/g	0.320	15.3	40.1	0.134
Percent RSD				0.05%	0.91%	15%	0.11%
C-OC03-M-1A	TCLP	100.9	µg/mL	6.94	18.3	0.156	1.20
C-OC03-M-1A	TCLP	100.4	µg/mL	6.46	16.9	0.078	1.32
C-OC03-M-1A Average	TCLP		µg/mL	6.70	17.6	0.12	1.26
Standard Deviation			µg/mL	0.34	0.98	0.055	0.079
Percent RSD				5%	6%	47%	6%
C-OC03-M-1A	-200 TM	8.1198	µg/g	219	447	50.6	30.5
C-OC03-M-1A	-200 TM	8.2182	µg/g	224	481	56.7	31.1
C-OC03-M-1A Average	-200 TM		µg/g	222	464	53.7	30.8
Standard Deviation			µg/g	3.54	24.04	4.313	0.424
Percent RSD				2%	5%	8%	1%
C-OC03-M-1A	+30 TM	7.7917	µg/g	1260	3750	46.8	237
C-OC04-T-1A	TCLP	100.3	µg/mL	5.08	7.58	0.048	0.889
C-OC04-T-1A	TCLP	101.6	µg/mL	5.00	7.97	0.070	0.926
C-OC04-T-1A Average	TCLP		µg/mL	5.04	7.78	0.059	0.907

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-OC04-T-1B	TCLP	102.1	µg/mL	5.28	7.67	0.061	0.936
C-OC04-T-1B	TCLP	100.7	µg/mL	5.21	7.96	0.084	0.949
C-OC04-T-1B Average	TCLP		µg/mL	5.24	7.81	0.072	0.942
C-OC04-T-1 Average	**TCLP**		**µg/mL**	**5.14**	**7.80**	**0.066**	**0.925**
Standard Deviation			**µg/mL**	**0.147**	**0.025**	**0.009**	**0.025**
Percent RSD				**2.9%**	**0.33%**	**14%**	**2.7%**
C-OC04-T-1D	-200 TM	8.2524	µg/g	163	266	62.6	22.5
C-OC04-T-1D	-200 TM	7.9683	µg/g	173	281	66.6	23.8
C-OC04-T-1D Average	-200 TM		µg/g	168	273	64.6	23.2
C-OC04-T-1E	-200 TM	8.1422	µg/g	167	273	65.3	23.0
C-OC04-T-1E	-200 TM	8.0154	µg/g	156	257	61.6	21.4
C-OC04-T-1E Average	-200 TM		µg/g	162	265	63.5	22.2
C-OC04-T-1 Average	**-200 TM**		**µg/g**	**165**	**269**	**64.0**	**22.7**
Standard Deviation			**µg/g**	**4.11**	**5.86**	**0.811**	**0.685**
Percent RSD				**2.5%**	**2.2%**	**1.3%**	**3.0%**
C-OC04-T-1D	**+30 TM**	**1.5692**	**µg/g**	**788**	**807**	**330**	**75.8**
C-OC04-T-1E	**+30 TM**	**1.1110**	**µg/g**	**166**	**123**	**61.8**	**11.6**
C-OC04-T-1A pH 6.13	TCLP	100.3	µg/mL	4.71	7.10	0.072	0.815
C-OC04-T-1A pH 6.04	TCLP	100.0	µg/mL	3.47	5.71	0.065	0.524
C-OC04-T-1A pH 6 Average	**TCLP**		**µg/mL**	**4.09**	**6.40**	**0.069**	**0.669**
Standard Deviation			**µg/mL**	**0.873**	**0.981**	**0.005**	**0.205**
Percent RSD				**21%**	**15%**	**7.6%**	**31%**
C-OC04-T-1A Water Wash	TCLP	102.4	µg/mL	4.71	6.39	0.125	0.49
C-OC04-T-1A Water Wash	TCLP	100.3	µg/mL	4.76	6.23	0.090	0.573
C-OC04-T-1A WW Average	**TCLP**		**µg/mL**	**4.74**	**6.31**	**0.108**	**0.532**
Standard Deviation			**µg/mL**	**0.037**	**0.110**	**0.025**	**0.059**
Percent RSD				**0.78%**	**1.7%**	**23%**	**11%**
C-OC05-FB-1A	TCLP	101.2	µg/mL	0.000	0.000	0.009	0.132
C-OC05-FB-1A	TCLP	101.0	µg/mL	0.000	0.000	0.000	0.100
C-OC05-FB-1A Average	**TCLP**		**µg/mL**	**0.000**	**0.000**	**0.005**	**0.116**
Standard Deviation			**µg/mL**	**0.000**	**0.000**	**0.006**	**0.023**
Percent RSD				**0%**	**0%**	**141%**	**20%**
C-OC05-FB-1A	TCLP	100.5	µg/mL	0.000	0.000	0.000	0.014
C-OC05-FB-1A	TCLP	102.1	µg/mL	0.167	0.227	0.000	0.419
C-OC05-FB-1A Average	**TCLP**		**µg/mL**	**0.083**	**0.113**	**0.000**	**0.217**
Standard Deviation			**µg/mL**	**0.118**	**0.160**	**0.000**	**0.287**
Percent RSD				**141%**	**141%**	**0%**	**132%**
C-OC05-FB-1A	-200 TM	8.4130	µg/g	13.4	3.23	0.521	7.81
C-OC05-FB-1A	-200 TM	8.0317	µg/g	9.88	2.18	0.102	6.74
C-OC05-FB-1A Average	**-200 TM**		**µg/g**	**11.6**	**2.71**	**0.312**	**7.28**
Standard Deviation			**µg/g**	**2.49**	**0.742**	**0.296**	**0.757**
Percent RSD				**21%**	**27%**	**95%**	**10%**
C-OC05-FB-1A	**+30 TM**	**2.7426**	**µg/g**	**0.000**	**0.000**	**0.000**	**13.0**
C-OC07-P-1A	TCLP	101.4	µg/mL	0.000	323	0.099	9.45
C-OC07-P-1A	TCLP	101.3	µg/mL	0.000	319	0.111	9.31
C-OC07-P1A Average	**TCLP**		**µg/mL**	**0.000**	**321**	**0.105**	**9.38**
Standard Deviation			**µg/mL**	**0.000**	**2.687**	**0.009**	**0.103**
Percent RSD				**0%**	**0.8%**	**8.4%**	**1.1%**
C-OC07-P-1A	**-200 TM**	**8.2565**	**µg/g**	**2440**	**12000**	**457**	**348**

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-OC07-P-1A	+30 TM	0.7630	µg/g	1060	4990	231	403
C-OC07-Q-1A	TM		µg/mL	0.647	29.3	0.080	17.5
C-OC10-T-1B pH 6.0	TCLP (ES #1)	101.2	µg/mL	6.90	23.9	0.255	1.88
C-OC10-T-1B pH 6.0	TCLP (ES #1)	100.2	µg/mL	6.85	23.3	0.398	1.85
C-OC10-T-1B pH 6.0	TCLP (ES #1)		µg/mL	6.87	23.6	0.327	1.86
Standard Deviation			µg/mL	0.035	0.424	0.101	0.019
Percent RSD				0.51%	1.8%	31%	1.0%
C-OC10-T-1C pH 8.0	TCLP (ES #1)	102.4	µg/mL	6.42	15.7	0.291	1.14
C-OC10-T-1C pH 8.0	TCLP (ES #1)	100.2	µg/mL	6.40	15.8	0.234	1.09
C-OC10-T-1C pH 8.0	TCLP (ES #1)		µg/mL	6.41	15.8	0.263	1.11
Standard Deviation			µg/mL	0.013	0.082	0.040	0.031
Percent RSD				0.20%	0.52%	15%	2.8%
C-OC10-T-1D pH 11.0	TCLP (ES #1)	100.4	µg/mL	8.36	14.8	0.520	1.24
C-OC10-T-1D pH 11.0	TCLP (ES #1)	102.1	µg/mL	8.33	14.9	0.455	1.56
C-OC10-T-1D pH 11.0	TCLP (ES #1)		µg/mL	8.35	14.9	0.487	1.40
Standard Deviation			µg/mL	0.016	0.059	0.046	0.227
Percent RSD				0.19%	0.40%	9.5%	16%
C-OC10-T-1B pH 6.0	TCLP (ES #2)	100.8	µg/mL	12.4	31.2	0.225	2.22
C-OC10-T-1B pH 6.0	TCLP (ES #2)	100.6	µg/mL	12.3	29.5	0.267	2.13
C-OC10-T-1B pH 6.0	TCLP (ES #2)		µg/mL	12.3	30.3	0.246	2.18
Standard Deviation			µg/mL	0.034	1.19	0.029	0.061
Percent RSD				0.27%	3.9%	12%	2.8%
C-OC10-T-1C pH 8.0	TCLP (ES #2)	100.3	µg/mL	12.9	25.8	0.430	1.55
C-OC10-T-1C pH 8.0	TCLP (ES #2)	101.6	µg/mL	13.7	25.2	0.354	1.59
C-OC10-T-1C pH 8.0	TCLP (ES #2)		µg/mL	13.3	25.5	0.392	1.57
Standard Deviation			µg/mL	0.529	0.368	0.054	0.031
Percent RSD				4.0%	1.4%	14%	2.0%
C-OC10-T-1D pH 11.0	TCLP (ES #2)	100.1	µg/mL	18.4	25.0	0.437	1.83
C-OC10-T-1D pH 11.0	TCLP (ES #2)	99.2	µg/mL	18.8	25.6	0.522	1.85
C-OC10-T-1D pH 11.0	TCLP (ES #2)		µg/mL	18.6	25.3	0.480	1.84
Standard Deviation			µg/mL	0.274	0.410	0.060	0.009
Percent RSD				1.5%	1.6%	13%	0.48%
C-OC10-T-1A	TCLP	100.2	µg/mL	10.7	22.2	0.096	2.25
C-OC10-T-1A	TCLP	99.9	µg/mL	11.2	21.3	0.124	2.14
C-OC10-T-1A	TCLP	100.8	µg/mL	10.7	21.7	0.122	2.13
C-OC10-T-1A	TCLP	100.2	µg/mL	10.7	22.2	0.096	2.25
C-OC10-T-1A Average	TCLP		µg/mL	10.8	21.8	0.109	2.19
C-OC10-T-2A	TCLP	100.8	µg/mL	10.8	21.7	0.122	2.13
C-OC10-T-2A	TCLP	101.1	µg/mL	11.3	21.5	0.227	2.63
C-OC10-T-2A Average	TCLP		µg/mL	11.0	21.6	0.175	2.38
C-OC10-T-A Average	TCLP		µg/mL	10.9	21.7	0.1	2.3
Standard Deviation			µg/mL	0.166	0.198	0.046	0.134
Percent RSD				1.5%	0.91%	33%	5.9%
C-OC10-T-3A WW	TCLP	101.5	µg/mL	9.85	18.4	0.108	1.42
C-OC10-T-3A WW	TCLP	100.2	µg/mL	9.30	17.3	0.114	1.25
C-OC10-T-3A WW Average	TCLP		µg/mL	9.58	17.8	0.111	1.33
Standard Deviation			µg/mL	0.389	0.781	0.004	0.118
Percent RSD				4.1%	4.4%	3.4%	8.8%
C-OC10-T-1A	-200 TM	8.0871	µg/g	765	844	167	65.5

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-OC10-T-1A	-200 TM	8.1648	µg/g	765	842	164	65.4
C-OC10-T-1A Average	**-200 TM**		**µg/g**	**765**	**843**	**166**	**65.4**
Standard Deviation			**µg/g**	**0.299**	**1.35**	**2.76**	**0.025**
Percent RSD				**0.04%**	**0.16%**	**1.7%**	**0.0%**
C-OC10-T-1A (1)	+30 TM	8.4577	µg/g	2340	1230	358	103
C-OC10-T-1A (2)	+30 TM	9.2889	µg/g	2321	999	323	96.4
C-OC10-T-1A (3)	+30 TM	3.3558	µg/g	812	413	129	45.1
C-OC10-T-1A Weighted Average	**+30 TM**		**µg/g**	**2089**	**998**	**306**	**90.8**
C-OC10-T-2A	-200 TM	8.0088	µg/g	792	842	171	65.2
C-OC10-T-2A	-200 TM	8.1277	µg/g	762	815	169	62.8
C-OC10-T-2A Average	**-200 TM**		**µg/g**	**777**	**828**	**170**	**64.0**
Standard Deviation			**µg/g**	**20.9**	**19.0**	**0.930**	**1.74**
Percent RSD				**2.7%**	**2.3%**	**0.55%**	**2.7%**
C-OC10-T-2A (1)	+30 TM	8.7572	µg/g	2340	1260	366	110
C-OC10-T-2A (2)	+30 TM	8.2849	µg/g	2296	989	324	101
C-OC10-T-2A (3)	+30 TM	7.0757	µg/g	1658	603	194	88.3
C-OC10-T-2A (4)	+30 TM	6.3034	µg/g	2150	1048	406	103
C-OC10-T-2A Weighted Average	**+30 TM**		**µg/g**	**2130**	**989**	**323**	**101**
C-OC11-O-1A	TCLP	100.1	µg/mL	1.52	610	4.22	1.49
C-OC11-O-1A	TCLP	100.3	µg/mL	2.97	630	2.88	1.65
C-OC11-O-1A Average	**TCLP**		**µg/mL**	**2.25**	**620**	**3.55**	**1.57**
Standard Deviation			**µg/mL**	**1.03**	**14.1**	**0.948**	**0.113**
Percent RSD				**46%**	**2.3%**	**27%**	**7.2%**
C-OC11-U-1A	TCLP	101.2	µg/mL	8.83	152	1.25	0.891
C-OC11-U-1A	TCLP	100.9	µg/mL	1.17	91.7	0.632	0.598
C-OC11-U-1A Average	TCLP		µg/mL	5.00	122	0.940	0.744
C-OC11-U-1B	TCLP	101.3	µg/mL	1.89	83.7	0.321	0.418
C-OC11-U-1B	TCLP	101.5	µg/mL	1.32	98.2	0.484	0.382
C-OC11-U-1B Average	TCLP		µg/mL	1.61	90.9	0.403	0.400
C-OC11-U-1 Average	**TCLP**		**µg/mL**	**3.30**	**106**	**0.671**	**0.572**
Standard Deviation			**µg/mL**	**2.40**	**21.9**	**0.380**	**0.243**
Percent RSD				**73%**	**21%**	**57%**	**43%**
C-OC11-U-1D	-200 TM	8.1531	µg/g	136	1530	88.7	31.4
C-OC11-U-1D	-200 TM	8.0783	µg/g	130	1620	87.4	30.3
C-OC11-U-1D Average	**-200 TM**		**µg/g**	**133**	**1575**	**88.1**	**30.8**
Standard Deviation			**µg/g**	**4.29**	**63.6**	**0.942**	**0.792**
Percent RSD				**3.2%**	**4.0%**	**1.1%**	**2.6%**
C-OC11-U-1D	**+30 TM**	**2.1401**	**µg/g**	**12600**	**47500**	**1500**	**1250**
C-OC11-U-1E	-200 TM	8.4928	µg/g	163	1280	61.9	31.3
C-OC11-U-1E	-200 TM	8.1248	µg/g	172	1680	85.5	38.1
C-OC11-U-1E Average	**-200 TM**		**µg/g**	**168**	**1480**	**73.7**	**34.7**
Standard Deviation			**µg/g**	**5.93**	**283**	**16.7**	**4.81**
Percent RSD				**3.5%**	**19%**	**23%**	**14%**
C-OC11-U-1E	**+30 TM**	**8.8716**	**µg/g**	**12600**	**12200**	**547**	**1330**
C-OC12-(C+F)-A	TCLP	100.2	µg/mL	18.8	39.3	0.184	3.09
C-OC12-(C+F)-A	TCLP	101.7	µg/mL	22.0	51.0	0.164	3.43
C-OC12-(C+F)-A Average	TCLP		µg/mL	20.4	45.1	0.174	3.26
C-OC12-(C+F)-B	TCLP	100.3	µg/mL	22.2	51.1	0.100	3.39
C-OC12-(C+F)-B	TCLP	100.5	µg/mL	22.1	50.7	0.124	3.34

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-OC12-(C+F)-B Average	TCLP		µg/mL	22.2	50.9	0.112	3.37
C-OC12-(C+F) Average	TCLP		µg/mL	21.3	48.0	0.143	3.31
Standard Deviation			µg/mL	1.26	4.05	0.044	0.074
Percent RSD				5.9%	8.4%	31%	2.2%
C-OC12-(C+F)-A	-200 TM	8.0697	µg/g	762	1520	276	92.9
C-OC12-(C+F)-A	-200 TM	8.1550	µg/g	769	1540	282	93.2
C-OC12-(C+F)-A Average			µg/g	765	1530	279	93.0
Standard Deviation			µg/g	5.47	14.1	3.76	0.241
Percent RSD				0.71%	0.92%	1.3%	0.26%
C-OC12-(C+F)-A (1)	+30 TM	8.0353	µg/g	1690	4860	491	277
C-OC12-(C+F)-A (2)	+30 TM	8.7783	µg/g	3028	5946	510	416
C-OC12-(C+F)-A (3)	+30 TM	8.5429	µg/g	1847	5154	518	300
C-OC12-(C+F)-A Weighted Ave.	+30 TM		µg/g	2206	5335	507	333
C-OC12-(C+F)-B	-200 TM	8.3335	µg/g	680	1320	238	81.2
C-OC12-(C+F)-B	-200 TM	8.3453	µg/g	673	1300	241	79.4
C-OC12-(C+F)-B Average			µg/g	676	1310	239	80.3
Standard Deviation			µg/g	5.00	14.1	2.13	1.25
Percent RSD				0.74%	1.1%	0.89%	1.6%
C-OC12-(C+F)-B	+30 TM	8.0361	µg/g	1280	3970	396	220
C-OC12-(C+F)-B	+30 TM	3.6057	µg/g	2757	5297	563	413
C-OC12-(C+F)-B Weighted Ave.	+30 TM		µg/g	1737	4381	448	280
C-OC12-P-1A	TCLP	100.0	µg/mL	0.200	262	0.344	9.67
C-OC12-P-1A (1)	decant TM		µg/mL	0.137	357	2.09	58.6
C-OC12-P-1A (2)	decant TM		µg/mL	0.131	356	2.34	58.5
C-OC12-P-1A Average	decant TM		µg/mL	0.134	357	2.22	58.6
Standard Deviation			µg/mL	0.005	0.707	0.175	0.047
Percent RSD				3.5%	0.20%	7.9%	0.08%
C-OC12-P-1A	-200 TM	8.0281	µg/g	2856	10055	576	352
C-OC12-P-1A	-200 TM	7.6911	µg/g	2816	9901	573	353
C-OC12-P-1A Average	-200 TM		µg/mL	2836	9978	574	352
Standard Deviation			µg/mL	28.3	109	2.11	0.426
Percent RSD				1.0%	1.1%	0.37%	0.12%
Lab Blank 1	TCLP	100.2	µg/mL	0.000	0.000	0.000	0.056
Lab Blank 2	TCLP	100.9	µg/mL	0.000	0.000	0.000	0.064
Lab Blank Average	TCLP		µg/mL	0.000	0.000	0.000	0.060
Standard Deviation			µg/mL	0.000	0.000	0.000	0.005
Percent RSD				0%	0%	0%	8.9%
Lab Blank	-200 TM	7.9746	µg/g	7.74	9.17	0.416	1.95
Lab Blank	-200 TM	8.1316	µg/g	5.74	8.37	0.283	1.76
Lab Blank	-200 TM	8.3166	µg/g	4.80	7.54	0.364	1.67
Lab Blank Average	-200 TM		µg/g	6.10	8.36	0.355	1.79
Standard Deviation			µg/g	1.50	0.813	0.067	0.14
Percent RSD				25%	10%	19%	8%
Raw Sand (1)	-200 TM	8.7402	µg/g	2.30	8.02	1.21	170
Raw Sand (2)	-200 TM	8.3788	µg/g	1.92	22.6	0.353	2.05
Raw Sand Average	-200 TM		µg/g	2.11	15.3	0.782	86.0
Standard Deviation			µg/g	0.269	10.3	0.606	119
Percent RSD				13%	67%	78%	138%
Raw Sand (1)	+30 TM	8.0299	µg/g	25.5	25.1	0.420	1.56

Fort Polk Data Results
Summary

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Raw Sand (2)	+30 TM	8.1903	µg/g	16.5	6.50	0.249	1.28
Raw Sand Weighted Average	**+30 TM**		**µg/g**	**21.0**	**15.7**	**0.334**	**1.42**

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.012	0.040	0.033	0.013
Check Standard			µg/mL	5.06	25.3	2.02	5.03
Percent Recovery				101%	101%	101%	101%
Calibration Verification Standard			µg/mL	2.59	12.9	1.02	2.56
Percent Recovery				104%	103%	102%	102%
Quantitation Limit Standard			µg/mL	0.538	2.69	0.137	0.535
Percent Recovery				108%	108%	68%	107%
Method Blank 1			µg/mL	0.000	0.006	0.000	0.017
C-SP15-T-1A	TCLP	101.5	µg/mL	0.868	3.08	0.041	4.24
C-SP15-T-1A Duplicate	TCLP	100.4	µg/mL	0.801	3.14	0.296	0.478
C-SP15-T-1B	TCLP	100.4	µg/mL	0.741	2.95	0.035	0.453
C-SP15-T-1B Duplicate	TCLP	100.4	µg/mL	0.744	3.01	0.032	0.420
C-SP15-T-1C	TCLP	100.2	µg/mL	0.726	3.10	0.414	0.421
C-SP15-T-1C Duplicate	TCLP	102.0	µg/mL	0.726	3.10	0.030	0.406
C-SP15-T-1B Post Spike	TCLP	100.4	µg/mL	1.37	6.35	1.08	1.26
Percent Recovery				104%	100%	106%	106%
Check Standard			µg/mL	5.16	26.5	2.03	5.18
Percent Recovery				103%	106%	102%	104%

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.003	0.057	0.023	0.003
Check Standard			µg/mL	5.04	25.1	1.99	5.01
Percent Recovery				101%	100%	100%	100%
Calibration Verification Standard			µg/mL	2.63	13.0	1.04	2.62
Percent Recovery				105%	104%	104%	105%
Quantitation Limit Standard			µg/mL	0.532	2.65	0.206	0.535
Percent Recovery				106%	106%	103%	107%
Method Blank 1			µg/mL	0.000	0.006	0.011	0.000
Method Blank 2			µg/mL	0.000	0.00	0.006	0.00
Method Blank 3			µg/mL	0.000	0.00	0.012	0.000
C-SP15-T-1X	TCLP	100.7	µg/mL	0.697	3.19	0.060	0.393
C-SP15-T-1X Duplicate	TCLP	100.5	µg/mL	0.688	3.16	0.070	0.791
C-SP15-T-1Y	TCLP	100.4	µg/mL	0.661	3.07	0.101	0.389
C-SP15-T-1Y Duplicate	TCLP	100.5	µg/mL	0.683	3.01	0.067	1.740
C-SP15-T-1Z	TCLP	101.2	µg/mL	0.662	3.02	0.057	0.994
C-SP15-T-1Z Duplicate	TCLP	100.4	µg/mL	0.629	3.00	0.068	0.37
C-SP15-T-1A PreSpike	TCLP	100.4	µg/mL	1.66	6.00	0.070	0.74
Percent Recovery				107%	95%	113%	110%
Check Standard			µg/mL	5.09	24.3	1.93	4.91
Percent Recovery				102%	97%	97%	98%

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.003	0.057	0.023	0.003
Check Standard			µg/mL	5.00	24.8	2.02	4.97

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ercent Recovery				100%	99%	101%	99%
alibration Verification Standard			µg/mL	2.57	12.8	1.01	2.57
ercent Recovery				103%	102%	101%	103%
uantitation Limit Standard			µg/mL	0.501	2.59	0.239	0.517
ercent Recovery				100%	104%	119%	103%
-SP15-T-1D	-200 TM	8.0279	µg/g	55.4	125	33.2	16.2
-SP15-T-1D Duplicate	-200 TM	7.9761	µg/g	54.4	123	33.4	15.9
-SP15-T-1E	-200 TM	7.9851	µg/g	61.5	121	31.1	16.4
-SP15-T-1E Duplicate	-200 TM	7.9571	µg/g	62.4	121	30.5	16.3
-SP15-T-1D Pre Spike	-200 TM	7.9842	µg/mL	8.34	17.7	4.44	2.51
ercent Recovery				99%	98%	89%	103%
heck Standard			µg/mL	5.05	25.4	2.04	5.02
ercent Recovery				101%	102%	102%	100%

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL	0.003	0.057	0.023	0.003
heck Standard			µg/mL	5.04	25.1	1.99	5.01
ercent Recovery				101%	100%	100%	100%
alibration Verification Standard			µg/mL	2.63	13.0	1.04	2.62
ercent Recovery				105%	104%	104%	105%
uantitation Limit Standard			µg/mL	0.532	2.65	0.206	0.535
ercent Recovery				106%	106%	103%	107%
lethod Blank 1			µg/mL	0.059	0.099	0.016	0.010
lethod Blank 2			µg/mL	0.022	0.026	0.000	0.001
lethod Blank 3			µg/mL	0.000	0.000	0.000	0.000
-SP15-T-1X	-200 TM	8.0319	µg/g	67.4	112	28.7	1.3
-SP15-T-1X Duplicate	-200 TM	7.9996	µg/g	68.3	115	30.1	1.31
-SP15-T-1Y	-200 TM	8.0508	µg/g	74.3	118	17.4	2.55
-SP15-T-1Y Duplicate	-200 TM	8.0505	µg/g	70.7	116	31.1	1.32
-SP15-T-1Z	-200 TM	8.1139	µg/g	104	125	31.7	1.57
-SP15-T-1Z Duplicate	-200 TM	8.0755	µg/g	108	126	31.4	1.58
RM 2711	-200 TM	8.0124	µg/g	110	864	306	1.14
ercent Recovery (Leach)				110%	79%	NA	5%
-SP15-T-1X Post Spike	-200 TM	8.0319	µg/mL	3.55	8.97	2.07	1.63
ercent Recovery				111%	98%	103%	104%
heck Standard			µg/mL	5.09	24.3	1.93	4.91
ercent Recovery				102%	97%	97%	98%

CLP - Treated (A,B & C)							
verage			µg/mL	0.768	3.07	0.141	1.07
tandard Deviation			µg/mL	0.057	0.071	0.170	1.553
ercent RSD				7.4%	2.3%	120%	145%

CLP - Treated (X,Y & Z)							
verage			µg/mL	0.670	3.08	0.071	0.780
tandard Deviation			µg/mL	0.025	0.082	0.016	0.536

Sept. 20

Percent RSD		3.7%	2.7%	22%	69%
Total Metals/Soil - Treated (D & E)					
Average	µg/g	58.4	122	32.1	16.2
Standard Deviation	µg/g	4.11	1.92	1.47	0.22
Percent RSD		7.0%	1.6%	4.6%	1.3%
Total Metals/Soil - Treated (X,Y & Z)					
Average	µg/g	82.1	119	28.4	1.6
Standard Deviation	µg/g	18.7	5.65	5.50	0.48
Percent RSD		23%	4.8%	19%	30%

Fort Polk
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TCLP

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL	0.008	0.065	0.046	0.009
Check Standard			µg/mL	5.02	25.1	2.01	5.00
Percent Recovery				100%	100%	101%	100%
Calibration Verification Standard			µg/mL	2.49	12.5	1.00	2.50
Percent Recovery				100%	100%	100%	100%
Quantitation Limit Standard			µg/mL	0.497	2.58	0.226	0.505
Percent Recovery				99%	103%	113%	101%
Blank			µg/mL	0.000	0.000	0.004	0.000
Method Blank 1 TCLP			µg/mL	0.000	0.000	0.002	0.000
Method Blank 2 TCLP			µg/mL	0.000	0.000	0.000	0.000
Method Blank 3 TCLP			µg/mL	0.000	0.000	0.004	0.000
C-SP21-T-A1	TCLP	100.2	µg/mL	1.79	5.92	0.068	0.376
C-SP21-T-A1 Duplicate	TCLP	100.0	µg/mL	1.81	5.86	0.074	1.042
C-SP21-T-B1	TCLP	100.2	µg/mL	1.99	6.02	0.074	0.418
C-SP21-T-B1 Duplicate	TCLP	100.3	µg/mL	1.88	6.28	0.044	0.930
C-SP21-T-C1	TCLP	100.3	µg/mL	1.63	6.02	0.072	0.805
C-SP21-T-C1 Duplicate	TCLP	100.7	µg/mL	1.58	5.82	0.072	0.401
C-SP21-L-A1	Leach - TCLP	101.7	µg/mL	1.77	21.3	0.080	1.08
C-SP12-Z1A	Organic - TCLP	100.1	µg/mL	1.94	11.1	0.064	1.15
C-SP15-U-A1	TCLP	100.1	µg/mL	1.76	22.1	0.152	1.45
C-SP21-T-A1 PostSpike	TCLP	100.2	µg/mL	3.656	15.26	2.16	2.44
Percent Recovery				102%	99%	105%	105%
Spiking Solution			µg/mL	10.6	51.5	10.1	10.4
Percent Recovery				106%	103%	101%	104%
Check Standard			µg/mL	5.02	24.8	2.01	4.94
Percent Recovery				100%	99%	101%	99%
Blank			µg/mL	0.015	0.049	0.006	0.000
C-SP15-U-A1 Duplicate	TCLP	100.8	µg/mL	0.659	58.7	0.407	0.220
C-SP15-U-B1	TCLP	100.6	µg/mL	0.673	30.9	0.107	0.190
C-SP15-U-B1 Duplicate	TCLP	100.8	µg/mL	0.493	11.6	0.051	0.179
C-SP15-U-C1	TCLP	100.3	µg/mL	0.516	37.6	0.466	0.723
C-SP15-U-C1 Duplicate	TCLP	100.6	µg/mL	0.419	47.0	0.770	0.177
Method Blank 1 Soil			µg/mL	0.036	0.136	0.014	0.000
Method Blank 2 Soil			µg/mL	0.000	0.000	0.020	0.000
Method Blank 3 Soil			µg/mL	0.000	0.000	0.005	0.000
Method Blank 4 Soil			µg/mL	0.000	0.000	0.008	0.000
C-SP21-T-D1	-200 TM	8.0726	µg/g	105	221	47.2	20.4
C-SP21-T-D1 Duplicate	-200 TM	8.0940	µg/g	107	224	47.1	20.1
C-SP21-T-E1	-200 TM	8.2876	µg/g	91.2	192	41.2	17.1
C-SP21-T-E1 Duplicate	-200 TM	8.1747	µg/g	92.4	194	40.9	17.3
C-SP15-U-D1	-200 TM	8.0089	µg/g	75.3	507	47.9	21.9
C-SP15-U-D1 Duplicate	-200 TM	7.9970	µg/g	73.8	502	44.9	21.6
C-SP15-U-E1	-200 TM	8.0496	µg/g	86.0	505	48.2	21.9
C-SP15-U-E1 Duplicate	-200 TM	8.0149	µg/g	84.5	498	47.4	21.4
C-SP21-T-D1 Post Spike	-200 TM	8.0726	µg/g	5.208	14	2.864	1.821
Percent Recovery				96%	97%	96%	100%

Fort Polk
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TCLP

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Spiking Solution			µg/mL	10.6	52.0	10.1	10.4
Percent Recovery				106%	104%	101%	104%
Check Standard			µg/mL	5.02	25.2	2.00	4.94
Percent Recovery				100%	101%	100%	99%
Blank			µg/mL	0.000	0.015	0.015	0.000
C-SP12-Z1 1	Organic - TM	2.0437	µg/g	3956	6370	33.6	1700
C-SP12-Z1 2	Organic - TM	2.0004	µg/g	4321	6630	32.4	1765
C-SP12-Z1 3	Organic - TM	2.0318	µg/g	3638	6231	32.0	1532
C-SP12-Z1 4	Organic - TM	2.0013	µg/g	4103	6602	33.4	1699
Spiking Solution			µg/mL	10.4	50.7	9.93	10.1
Percent Recovery (Leach)				104%	101%	99%	101%
Check Standard			µg/mL	4.98	24.9	1.96	4.91
Percent Recovery				100%	100%	98%	98%
Blank			µg/mL	0.001	0.029	0.012	0.006
TCLP - Treated							
Average			µg/mL	1.78	5.99	0.067	0.662
Standard Deviation			µg/mL	0.152	0.167	0.012	0.299
Percent RSD				8.53%	2.78%	17.33%	45.13%
TCLP - Untreated							
Average			µg/mL	0.754	34.6	0.325	0.490
Standard Deviation			µg/mL	0.504	17.0	0.275	0.516
Percent RSD				67%	49%	84%	105%
Total Metals/Soil - Treated							
Average			µg/g	99.0	208.1	44.1	18.7
Standard Deviation			µg/g	8.28	17.10	3.55	1.74
Percent RSD				8.4%	8.2%	8.1%	9.3%
Total Metals/Soil - Untreated							
Average			µg/g	79.9	503	47.1	21.7
Standard Deviation			µg/g	6.23	4.11	1.50	0.23
Percent RSD				7.8%	0.8%	3.2%	1.1%
Total Metals/Organic							
Average			µg/g	4005	6458	32.9	1674
Standard Deviation			µg/g	287	191	0.77	100
Percent RSD				7.2%	3.0%	2.4%	6.0%

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
strument Detection Limit			µg/mL	0.012	0.019	0.008	0.01
heck Standard			µg/mL	5.25	26.13	2.092	5.221
ercent Recovery				105%	105%	105%	104%
alibration Verification Standard			µg/mL	2.61	13.0	1.05	2.60
ercent Recovery				104%	104%	105%	104%
uantitation Limit Standard			µg/mL	0.421	2.14	0.167	0.418
ercent Recovery				84%	86%	84%	84%
lank			µg/mL	0.000	0.025	0.000	0.000
ethod Blank 1 TCLP			µg/mL	0.000	0.000	0.000	0.000
ethod Blank 2 TCLP			µg/mL	0.000	0.000	0.000	0.000
ethod Blank 3 TCLP			µg/mL	0.000	0.000	0.000	0.000
-SP25-T-1A	TCLP	100.2	µg/mL	6.84	10.1	0.025	1.14
-SP25-T-1A Duplicate	TCLP	100.8	µg/mL	7.08	10.4	0.024	3.81
-SP25-T-1B	TCLP	100.6	µg/mL	7.01	10.1	0.013	5.91
-SP25-T-1B Duplicate	TCLP	100.8	µg/mL	7.11	10.4	0.000	1.35
-SP25-T-1C	TCLP	100.3	µg/mL	6.88	10.1	0.009	1.24
-SP25-T-1C Duplicate	TCLP	100.6	µg/mL	7.11	10.4	0.003	1.30
-SP25-T-1A Post Spike	TCLP	100.2	µg/mL	4.12	9.37	1.07	1.57
ercent Recovery				104%	97%	106%	105%
piking Solution			µg/mL	10.96	53.37	10.55	10.87
ercent Recovery				110%	107%	106%	109%
heck Standard			µg/mL	5.303	26.27	2.116	5.251
ercent Recovery				106%	105%	106%	105%
ank			µg/mL	0.008	0.075	0.000	0.000
eth Blk-1 Soil			µg/mL	0.048	0.049	0.000	0.010
eth Blk-2 Soil			µg/mL	0.027	0.013	0.000	0.010
eth Blk-3 Soil			µg/mL	0.001	0.019	0.000	0.000
-SP15-L-A1	Leach - TM	8.3036	µg/g	244	829	139	51.4
-SP15-L-A1 Duplicate	Leach - TM	8.2016	µg/g	250	835	138	52.4
-SP25-T-1D	-200 TM	8.2463	µg/g	218	326	55.0	33.3
-SP25-T-1D Duplicate	-200 TM	8.3083	µg/g	216	324	54.4	32.4
-SP25-T-1E	-200 TM	8.1410	µg/g	208	325	53.8	30.7
-SP25-T-1E Duplicate	-200 TM	8.2106	µg/g	219	344	55.1	32.4
-SP15-L-A1 Post Spike	-200 TM	8.3036	µg/g	11.5	40.3	7.05	3.20
ercent Recovery				133%	117%	126%	106%
piking Solution			µg/mL	10.54	52.64	10.71	10.83
ercent Recovery				105%	105%	107%	108%
heck Standard			µg/mL	5.363	26.81	2.097	5.327
ercent Recovery				107%	107%	105%	107%
lank			µg/mL	0.000	0.027	0.001	0.000

CLP - Treated	Units	Copper	Lead	Antimony	Zinc
verage	µg/mL	7.01	10.25	0.01	2.46
tandard Deviation	µg/mL	0.117	0.167	0.011	1.979
ercent RSD		1.7%	1.6%	85%	81%

otal Metals/Soils - Treated	Units	Copper	Lead	Antimony	Zinc
verage	µg/g	215	330	54.6	32.2
tandard Deviation	µg/g	5.31	9.35	0.64	1.10
ercent RSD		2.5%	2.8%	1.2%	3.4%

Sept. 28

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.004	0.023	0.029	0.003
Check Standard			µg/mL	5.01	24.9	2.01	4.98
Percent Recovery				100%	100%	101%	100%
Calibration Verification Standard			µg/mL	2.52	12.5	1.02	2.51
Percent Recovery				101%	100%	102%	100%
Quantitation Limit Standard			µg/mL	0.511	2.56	0.191	0.505
Percent Recovery				102%	102%	96%	101%
Method Blank 1 TCLP			µg/mL	0.000	0.000	0.000	0.000
Method Blank 2 TCLP			µg/mL	0.000	0.000	0.000	0.000
Method Blank 3 TCLP			µg/mL	0.000	0.000	0.000	0.000
C-SP21-T-X1	TCLP	100.1	µg/mL	1.93	7.37	0.080	0.526
C-SP21-T-X1 Duplicate	TCLP	100.4	µg/mL	1.85	6.68	0.064	1.898
C-SP21-T-Y1	TCLP	100.5	µg/mL	1.78	6.47	0.049	0.948
C-SP21-T-Y1 Duplicate	TCLP	100.1	µg/mL	1.77	6.43	0.064	0.470
C-SP21-T-Z1	TCLP	100.2	µg/mL	1.71	6.02	0.076	0.870
C-SP21-T-Z1 Duplicate	TCLP	100.5	µg/mL	1.67	5.98	0.072	0.439
C-SP21-T-X1 Post Spike	TCLP	100.1	µg/mL	1.92	8.25	1.09	1.30
Percent Recovery				105%	99%	105%	106%
Spiking Solution			µg/mL	10.8	52.5	10.3	10.7
Percent Recovery				108%	105%	103%	107%
Check Standard			µg/mL	5.09	24.9	1.97	4.99
Percent Recovery				102%	100%	99%	100%
Blank			µg/mL	0.028	0.000	0.005	0.000
Method Blank 1 Rock			µg/mL	0.066	0.009	0.000	0.012
Method Blank 2 Rock			µg/mL	0.018	0.000	0.003	0.000
C-SP15-T-1E (1)	+30 TM	7.7019	µg/g	16.4	71.1	7.80	19.8
C-SP15-T-1E (2)	+30 TM	8.0817	µg/g	152	69.0	8.19	166
C-SP15-T-1D (1)	+30 TM	5.3520	µg/g	479	56.9	4.18	57.3
C-SP15-T-1D (2)	+30 TM	5.0728	µg/g	64.6	47.8	5.50	21.2
C-SP15-T-1X (1)	+30 TM	8.0690	µg/g	17.6	86.0	7.08	13.0
C-SP15-T-1X (2)	+30 TM	7.9383	µg/g	35.5	172	13.7	18.6
C-SP15-T-1Y (1)	+30 TM	6.6212	µg/g	30.1	157	13.6	15.1
Method Blank 4 Rock			µg/mL	0.000	0.000	0.008	0.000
C-SP15-T-1Y (2)	+30 TM	6.7952	µg/g	11.2	57.9	5.69	11.0
C-SP15-T-1Z (1)	+30 TM	5.5155	µg/g	25.9	135	7.53	16.7
C-SP15-T-2Z (2)	+30 TM	5.4756	µg/g	8.56	41.9	5.64	17.0
C-SP21-T-1E Post Spike	+30 TM	7.7019	µg/mL	1.642	7.328	1.295	1.758
Percent Recovery				101%	92%	99%	100%
Spiking Solution			µg/mL	10.8	52.9	10.3	10.7
Percent Recovery				108%	106%	103%	107%
Check Standard			µg/mL	5.06	25.3	1.99	5.01
Percent Recovery				101%	101%	100%	100%
Blank			µg/mL	0.002	0.000	0.001	0.000

Oct. 5

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL	0.007	0.097	0.022	0.003
heck Standard			µg/mL	5.002	25.17	2.046	5.043
ercent Recovery				100%	101%	102%	101%
alibration Verification Standard			µg/mL	2.55	12.9	1.01	2.58
ercent Recovery				102%	103%	101%	103%
uantitation Limit Standard			µg/mL	0.486	2.52	0.215	0.507
ercent Recovery				97%	101%	107%	101%
lank			µg/mL	0.000	0.013	0.000	0.000
lethod Blank 1 TCLP			µg/mL	0.000	0.000	0.000	0.000
lethod Blank 2 TCLP			µg/mL	0.000	0.000	0.000	0.000
lethod Blank 3 TCLP			µg/mL	0.000	0.000	0.000	0.000
-OC02-T-1A	TCLP	101.0	µg/mL	6.70	10.8	0.098	4.16
-OC02-T-1A Duplicate	TCLP	101.1	µg/mL	7.24	10.9	0.044	1.43
-OC02-T-1B	TCLP	100.4	µg/mL	6.74	11.2	0.022	1.36
-OC02-T-1B Duplicate	TCLP	100.3	µg/mL	6.87	11.0	0.050	1.87
-OC02-T-1C	TCLP	101.5	µg/mL	7.20	11.6	0.053	1.55
-OC02-T-1C Duplicate	TCLP	100.9	µg/mL	7.75	11.7	0.072	1.38
-OC02-T-1C Post Spike	TCLP	100.9	µg/mL	4.43	10.0	1.06	1.65
ercent Recovery				94%	95%	103%	103%
piking Solution			µg/mL	10.3	50.5	10.2	10.4
ercent Recovery				103%	101%	102%	104%
heck Standard			µg/mL	5.052	25.28	1.991	5.037
ercent Recovery				101%	101%	100%	101%
lank			µg/mL	0.011	0.054	0.000	0.012
lethod Blank 1 Soil			µg/mL	0.022	0.019	0.000	0.019
lethod Blank 2 Soil			µg/mL	0.000	0.000	0.000	0.006
lethod Blank 3 Soil			µg/mL	0.000	0.000	0.000	0.003
-OC02-T-1D	-200 TM	8.3830	µg/g	353	399	89.0	46.1
-OC02-T-1D Duplicate	-200 TM	8.2599	µg/g	367	415	93.4	47.9
-OC02-T-1D Pre Spike	-200 TM	8.0772	µg/mL	16.63	20.41	4.446	2.465
ercent Recovery				105%	99%	76%	95%
-OC02-T-1E	-200 TM	8.2571	µg/g	349	390	91.6	42.6
-OC02-T-1E Duplicate	-200 TM	8.1989	µg/g	369	413	93.6	45.1
-OC02-T-1E Post Spike	-200 TM	8.1989	µg/mL	16.11	21.01	4.752	2.69
ercent Recovery				98%	82%	91%	84%
piking Solution			µg/mL	10.5	51.5	10.2	10.5
ercent Recovery				105%	103%	102%	105%
heck Standard			µg/mL	5.05	25.37	2.016	5.00
ercent Recovery				101%	101%	101%	100%
lank			µg/mL	0.006	0.059	0.000	0.007

TCLP - Treated	Units	Copper	Lead	Antimony	Zinc
Average	µg/mL	7.08	11.2	0.06	1.96
Standard Deviation	µg/mL	0.397	0.369	0.026	1.097
Percent RSD		5.6%	3.3%	46%	56%

Total Metals/Soils - Treated	Units	Copper	Lead	Antimony	Zinc
Average	µg/g	360	404	92	45
Standard Deviation	µg/g	9.89	11.87	2.15	2.22
Percent RSD		2.7%	2.9%	2.3%	4.9%

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.007	0.007	0.022	0.004
Check Standard			µg/mL	5.24	26.1	2.07	5.22
Percent Recovery				105%	104%	104%	104%
Calibration Verification Standard			µg/mL	2.66	13.0	1.06	2.63
Percent Recovery				106%	104%	106%	105%
Quantitation Limit Standard			µg/mL	0.536	2.71	0.211	0.531
Percent Recovery				107%	108%	106%	106%
Blank			µg/mL	0.000	0.051	0.000	0.000
Method Blank 1 TCLP			µg/mL	0.000	0.000	0.001	0.000
Method Blank 2 TCLP			µg/mL	0.000	0.000	0.002	0.000
Method Blank 3 TCLP			µg/mL	0.000	0.000	0.000	0.000
C-SP21-U-1A	TCLP	100.8	µg/mL	0.830	21.8	0.221	0.217
C-SP21-U-1A Duplicate	TCLP	101.4	µg/mL	0.480	18.7	0.070	0.638
C-SP21-U-1B	TCLP	101.2	µg/mL	0.419	14.5	0.084	0.209
C-SP21-U-1B Duplicate	TCLP	100.6	µg/mL	0.505	29.7	0.232	0.620
C-SP21-U-1C	TCLP	101.4	µg/mL	1.97	17.3	0.096	0.658
C-SP21-U-1C Duplicate	TCLP	100.1	µg/mL	1.80	23.7	0.089	0.31
C-SP21-U-1C Pre Spike	TCLP	100.1	µg/mL	2.61	26.4	0.346	0.566
Percent Recovery				101%	90%	129%	106%
C-SP21-U-1A Post Spike	TCLP	100.8	µg/mL	1.41	14.8	1.13	1.18
Percent Recovery				104%	99%	103%	108%
Spiking Solution			µg/mL	10.4	52.4	10.0	10.7
Percent Recovery				104%	105%	100%	107%
Check Standard			µg/mL	5.25	26.1	2.01	5.22
Percent Recovery				105%	104%	101%	104%
Blank			µg/mL	0.011	0.055	0.000	0.002
Method Blank 1 Soil			µg/mL	0.031	0.031	0.000	0.017
Method Blank 2 Soil			µg/mL	0.022	0.000	0.000	0.018
Method Blank 3 Soil			µg/mL	0.004	0.000	0.000	0.007
C-SP21-U-1D	-200 TM	8.1610	µg/g	95.1	571	47.2	25.0
C-SP21-U-1D Duplicate	-200 TM	8.1059	µg/g	73.2	408	33.2	18.3
C-SP21-U-1D Pre Spike	-200 TM	8.2840	µg/mL	12.8	53.7	5.63	3.45
Percent Recovery				146%	164%	115%	138%
C-SP21-U-1E	-200 TM	8.2839	µg/g	74.5	511	42.3	21.4
C-SP21-U-1E Duplicate	-200 TM	8.1830	µg/g	77.1	511	41.2	21.9
C-SP21-U-1E Post Spike	-200 TM	8.1830	µg/mL	4.06	25.3	2.50	1.79
Percent Recovery				91%	88%	82%	90%
Spiking Solution			µg/mL	10.5	53.1	9.7	10.77
Percent Recovery				105%	106%	97%	108%
Check Standard			µg/mL	5.29	26.5	1.93	5.24
Percent Recovery				106%	106%	97%	105%
Blank			µg/mL	0.001	0.026	0.000	0.000

TCLP - Untreated	Units	Copper	Lead	Antimony	Zinc
Average	µg/mL	1.00	21.0	0.13	0.44
Standard Deviation	µg/mL	0.702	5.370	0.074	0.219
Percent RSD		70%	26%	56%	49%

Oct. 7

Total Metals/Soils - Untreated		Copper	Lead	Antimony	Zinc
Average	µg/g	80	500	41	22
Standard Deviation	µg/g	10.22	67.51	5.80	2.76
Percent RSD		13%	13%	14%	13%

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.004	0.058	0.015	0.002
Check Standard			µg/mL	4.93	24.3	2.00	4.96
Percent Recovery				99%	97%	100%	99%
Calibration Verification Standard			µg/mL	2.48	12.3	1.02	2.53
Percent Recovery				99%	98%	102%	101%
Quantitation Limit Standard			µg/mL	0.514	0.26	0.200	0.539
Percent Recovery				103%	10%	100%	108%
Blank			µg/mL	0.000	0.071	0.000	0.004
Method Blank 1 TCLP			µg/mL	0.000	0.000	0.000	0.000
Method Blank 2 TCLP			µg/mL	0.000	0.000	0.000	0.000
Method Blank 3 TCLP			µg/mL	0.000	0.000	0.000	0.000
C-OC02-F-1A	TCLP	100.5	µg/mL	7.73	15.2	0.168	1.18
C-OC02-F-1A Duplicate	TCLP	100.2	µg/mL	7.94	15.0	0.173	1.40
C-OC02-F-1A Pre Spike	TCLP	100.5	µg/mL	4.32	9.05	0.208	0.705
Percent Recovery				57%	48%	62%	48%
C-SP25-U-1A	TCLP	101.0	µg/mL	0.416	14.7	0.070	0.184
C-SP25-U-1A Duplicate	TCLP	100.2	µg/mL	0.492	27.9	0.241	1.38
C-SP25-U-1B	TCLP	101.2	µg/mL	2.21	51.1	0.785	0.216
C-SP25-U-1B Duplicate	TCLP	100.9	µg/mL	0.360	12.2	0.072	0.159
C-SP25-U-1C	TCLP	101.7	µg/mL	0.550	16.1	0.184	0.544
C-SP25-U-1C Duplicate	TCLP	101.1	µg/mL	0.386	10.0	0.046	0.207
C-OC02-F-1A Post Spike	TCLP	100.5	µg/mL	4.44	11.4	1.15	1.57
Percent Recovery				58%	76%	107%	98%
Spiking Solution			µg/mL	10.2	49.5	10.2	10.8
Percent Recovery				102%	99%	102%	108%
Check Standard			µg/mL	4.91	24.3	2.01	4.98
Percent Recovery				98%	97%	101%	100%
Blank			µg/mL	0.008	0.071	0.000	0.009
Method Blank 1 Soil			µg/mL	0.019	0.020	0.003	0.016
Method Blank 2 Soil			µg/mL	0.000	0.000	0.000	0.005
Method Blank 3 Soil			µg/mL	0.000	0.000	0.000	0.003
C-SP25-U-1E	-200 TM	8.1242	µg/g	86.0	623	62.7	27.3
C-SP25-U-1D	-200 TM	8.1455	µg/g	87.9	643	64.8	26.3
C-SP25-U-1E Duplicate	-200 TM	8.2112	µg/g	95.0	676	65.4	29.8
C-SP25-U-1D Duplicate	-200 TM	8.1757	µg/g	89.3	646	66.4	26.9
C-SP25-U-1D Post Spike	-200 TM	8.1757	µg/mL	4.45	30.2	3.43	1.94
Percent Recovery				80%	76%	72%	84%
Spiking Solution			µg/mL	10.3	50.2	10.3	10.6
Percent Recovery				103%	100%	103%	106%
Check Standard			µg/mL	4.91	24.4	1.99	4.97
Percent Recovery				98%	98%	100%	99%
Blank			µg/mL	0.000	0.017	0.000	0.004

TCLP - Untreated	Units	Copper	Lead	Antimony	Zinc
Average	µg/mL	0.736	22.002	0.233	0.448
Standard Deviation	µg/mL	0.726	15.553	0.281	0.478
Percent RSD		99%	71%	121%	107%

Oct. 8

ɔtal Metals/Soils - Untreated		Copper	Lead	Antimony	Zinc
/erage	µg/g	89.6	647.0	64.8	27.6
:andard Deviation	µg/g	3.86	21.9	1.59	1.56
ɜrcent RSD		4%	3%	2%	6%

Oct. 10

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.955	25.18	1.964	4.997
Percent Recovery				99%	101%	98%	100%
Calibration Verification Standard			µg/mL	2.56	12.9	1.03	2.56
Percent Recovery				102%	103%	103%	102%
Quantitation Limit Standard			µg/mL	0.526	2.56	0.230	0.485
Percent Recovery				105%	102%	115%	97%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank 1 TCLP			µg/mL	0.000	0.000	0.000	0.000
Method Blank 2 TCLP			µg/mL	0.000	0.000	0.000	0.000
Method Blank 3 TCLP			µg/mL	0.000	0.000	0.000	0.000
C-OC04-T-1A	TCLP	100.3	µg/mL	5.08	7.58	0.048	0.889
C-OC04-T-1A Duplicate	TCLP	101.6	µg/mL	5.00	7.97	0.070	0.926
C-OC04-T-1B	TCLP	102.1	µg/mL	5.28	7.67	0.061	0.936
C-OC04-T-1B Duplicate	TCLP	100.7	µg/mL	5.21	7.96	0.084	0.949
C-OC04-T-1B Pre Spike (1)	TCLP	100.7	µg/mL	7.23	17.4	0.195	1.97
Percent Recovery				101%	94%	111%	102%
C-OC04-T-1B Pre Spike (2)	TCLP	100.7	µg/mL	7.38	17.7	0.148	2.01
Percent Recovery				108%	98%	64%	106%
C-OC04-T-1B Post Spike	TCLP	100.7	µg/mL	3.28	8.0	1.01	1.40
Percent Recovery				99%	92%	99%	100%
Spiking Solution			µg/mL	10.3	50.8	9.7	10.4
Percent Recovery				103%	102%	97%	104%
Check Standard			µg/mL	4.926	24.75	1.873	4.88
Percent Recovery				99%	99%	94%	98%
Blank			µg/mL	0.015	0.000	0.000	0.000
Method Blank 1 Soil			µg/mL	0.029	0.000	0.000	0.000
Method Blank 2 Soil			µg/mL	0.002	0.000	0.000	0.000
Method Blank 3 Soil			µg/mL	0.003	0.000	0.000	0.000
C-OC04-T-1D	-200 TM	8.2524	µg/g	163	266	62.6	22.5
C-OC04-T-1D Duplicate	-200 TM	7.9683	µg/g	173	281	66.6	23.8
C-OC04-T-1D Pre Spike (1)	-200 TM	8.3488	µg/mL	11.4	19.3	4.35	1.85
Percent Recovery				109%	98%	83%	111%
C-OC04-T-1D Pre Spike (1)	-200 TM	8.2839	µg/g	10.4	17.9	3.92	1.69
Percent Recovery				86%	83%	62%	91%
C-OC04-T-1D (1)	+30 TM	1.5692	µg/g	788	807	330	75.8
C-OC04-T-1D (2)	+30 TM	1.1110	µg/g	166	123	61.8	11.6
C-OC04-T-1E	-200 TM	8.1422	µg/g	167	273	65.3	23.0
C-OC04-T-1E Duplicate	-200 TM	8.0154	µg/g	156	257	61.6	21.4
C-OC04-T-1E Post Spike	-200 TM	8.0154	µg/mL	7.66	15.9	3.69	1.95
Percent Recovery				140%	112%	122%	109%
Spiking Solution			µg/mL	10.4	52.7	10.2	10.49
Percent Recovery				104%	105%	102%	105%
Check Standard			µg/mL	4.993	25.92	1.949	4.97
Percent Recovery				100%	104%	97%	99%
Blank			µg/mL	0.019	0.000	0.000	0.000

Oct. 10

'CLP - Treated		Copper	Lead	Antimony	Zinc
\verage	µg/mL	5.14	7.80	0.066	0.925
;tandard Deviation	µg/mL	0.128	0.199	0.015	0.026
'ercent RSD		2%	3%	23%	3%

'otal Metals/Soils - Treated		Copper	Lead	Antimony	Zinc
\verage	µg/g	165	269	64	23
;tandard Deviation	µg/g	6.96	10.19	2.33	1.04
'ercent RSD		4%	4%	4%	5%

Oct. 14

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.99	25.4	2.02	5.05
Percent Recovery				100%	101%	101%	101%
Calibration Verification Standard			µg/mL	2.49	12.3	1.02	2.56
Percent Recovery				100%	98%	102%	102%
Quantitation Limit Standard			µg/mL	0.492	1.93	0.229	0.521
Percent Recovery				98%	77%	115%	104%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank 1			µg/mL	0.000	0.000	0.000	0.000
Method Blank 2			µg/mL	0.000	0.000	0.005	0.000
Method Blank 3			µg/mL	0.000	0.000	0.013	0.000
C-OC07-P-1A	TCLP	101.4	µg/mL	0.000	323	0.099	9.45
C-OC07-P-1A Pre Spike (1)	TCLP	101.3	µg/mL	1.00	166.8	0.125	5.23
Percent Recovery				100%	106%	151%	101%
C-OC07-P-1A Duplicate	TCLP	101.3	µg/mL	0.000	319	0.111	9.31
C-OC07-P-1A Pre Spike (2)	TCLP	101.3	µg/mL	1.02	165	0.107	5.20
Percent Recovery				102%	106%	104%	109%
C-OC07-P-1A Post Spike	TCLP	101.4	µg/mL	0.986	150	1.09	5.30
Percent Recovery				99%	87%	105%	104%
Spiking Solution			µg/mL	10.2	51.5	10.0	10.2
Percent Recovery				102%	103%	100%	102%
Check Standard			µg/mL	10.3	50.2	9.991	10.16
Percent Recovery				103%	100%	100%	102%
Blank			µg/mL	0.002	0.000	0.027	0.016
Method Blank 1 Soil			µg/mL	0.000	0.000	0.012	0.018
Method Blank 2 Soil			µg/mL	0.000	0.000	0.013	0.003
C-OC07-P-1A	+30 TM	0.7630	µg/g	1059	4993	231	403
C-OC07-P-1A	-200 TM	8.2565	µg/g	2435	11984	457	348
C-OC07-P-1A Pre Spike (1)	-200 TM	6.6623	µg/mL	3.73	18.2	0.54	0.54
Percent Recovery				303%	685%	-86%	239%
C-OC07-P-1A Pre Spike (2)	-200 TM	8.0990	µg/g	3.35	16.2	0.704	0.484
Percent Recovery				-375%	-1013%	-46%	-251%
C-OC07-P-1A Post Spike	-200 TM	8.2565	µg/mL	4.67	23.1	1.64	1.47
Percent Recovery				65%	67%	88%	90%
Spiking Solution			µg/mL	10.1	49.7	9.86	10.0
Percent Recovery				101%	99%	99%	100%
Check Standard			µg/mL	4.93	24.9	1.98	5.01
Percent Recovery				99%	99%	99%	100%
Blank			µg/mL	0.000	0.000	0.000	0.011

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.03	25.32	2.034	5.02
Percent Recovery				101%	101%	102%	100%
Calibration Verification Standard			µg/mL	2.46	12.4	1.00	2.49
Percent Recovery				98%	99%	100%	100%
Quantitation Limit Standard			µg/mL	0.496	2.65	0.212	0.526
Percent Recovery				99%	106%	106%	105%
Blank			µg/mL	0.000	0.000	0.001	0.000
Method Blank 1			µg/mL	0.000	0.000	0.000	0.000
Method Blank 2			µg/mL	0.000	0.000	0.000	0.000
C-OC12-P-1A (1)	leachate		µg/mL	0.137	357	2.09	58.6
C-OC12-P-1A (2)	leachate		µg/mL	0.131	356	2.34	58.5
C-OC12-P-1A (3)	leachate		µg/mL	0.758	360	2.23	59.2
C-OC12-P-1A (4)	leachate		µg/mL	0.750	355	2.24	58.3
C-OC12-P-1A (1) Post Spike			µg/mL	1.230	287	2.60	47.1
Percent Recovery				111%	-682%	71%	-562%
Spiking Solution			µg/mL	9.748	51	9.53	9.68
Percent Recovery				97%	102%	95%	97%
Check Standard			µg/mL	5.011	25.35	1.987	5.032
Percent Recovery				100%	101%	99%	101%
Blank			µg/mL	0.000	0.258	0.000	0.041
Method Blank 1			µg/mL	0.000	0.000	0.000	0.000
Method Blank 2			µg/mL	0.000	0.000	0.000	0.000
C-OC10-T-1B pH 6.0	TCLP (ES #1)	101.2	µg/mL	6.90	23.9	0.255	1.88
C-OC10-T-1B pH 6.0 Duplicate	TCLP (ES #1)	100.2	µg/mL	6.85	23.3	0.398	1.85
C-OC10-T-1C pH 8.0	TCLP (ES #1)	102.4	µg/mL	6.42	15.7	0.291	1.14
C-OC10-T-1C pH 8.0 Duplicate	TCLP (ES #1)	100.2	µg/mL	6.40	15.8	0.234	1.09
C-OC10-T-1D pH 11.0	TCLP (ES #1)	100.4	µg/mL	8.36	14.8	0.520	1.24
C-OC10-T-1D pH 11.0 Duplicate	TCLP (ES #1)	102.1	µg/mL	8.33	14.9	0.455	1.56
C-OC10-T-1D pH 11.0 Pre Spike	TCLP (ES #1)	102.1	µg/mL	10.4	24.5	0.660	2.61
Percent Recovery				105%	96%	205%	104%
C-OC10-T-1D pH 11.0 Pre Spike	TCLP (ES #1)	102.1	µg/mL	10.42	24.5	0.586	2.59
Percent Recovery				104%	96%	132%	103%
C-OC10-T-1B pH 6.0	TCLP (ES #2)	100.8	µg/mL	12.4	31.2	0.225	2.22
C-OC10-T-1B pH 6.0 Duplicate	TCLP (ES #2)	100.6	µg/mL	12.3	29.5	0.267	2.13
C-OC10-T-1B pH 6.0 Post Spike	TCLP (ES #1)	101.2	µg/mL	4.08	15.4	1.17	1.85
Percent Recovery				98%	93%	105%	101%
Spiking Solution			µg/mL	10.2	49.1	9.85	10.0
Percent Recovery				102%	98%	98%	100%
Check Standard			µg/mL	5.04	25.0	1.95	5.01
Percent Recovery				101%	100%	98%	100%
Blank			µg/mL	0.000	0.088	0.000	0.013
C-OC10-T-1C pH 8.0	TCLP (ES #2)	100.3	µg/mL	12.9	25.8	0.430	1.55
C-OC10-T-1C pH 8.0 Duplicate	TCLP (ES #2)	101.6	µg/mL	13.7	25.2	0.354	1.59
C-OC10-T-1D pH 11.0	TCLP (ES #2)	100.1	µg/mL	18.4	25.0	0.437	1.83
C-OC10-T-1D pH 11.0 Duplicate	TCLP (ES #2)	99.2	µg/mL	18.8	25.6	0.522	1.85
C-OC10-T-2A	TCLP	100.8	µg/mL	10.8	21.7	0.122	2.13
C-OC10-T-1A	TCLP	100.2	µg/mL	10.7	22.2	0.096	2.25

Oct. 16

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Method Blank 1 Soil			µg/mL	0.038	0.263	0.000	0.023
Method Blank 2 Soil			µg/mL	0.005	0.010	0.000	0.023
Method Blank 3 Soil			µg/mL	0.000	0.029	0.063	0.010
C-OC10-T-1A	-200 TM	8.0871	µg/g	765	844	167	65.5
C-OC10-T-1A Duplicate	-200 TM	8.1648	µg/g	765	842	164	65.4
C-OC10-T-1A Pre Spike (1)	-200 TM	8.0908	µg/mL	34.1	40.8	7.89	3.35
Percent Recovery				79%	84%	60%	88%
C-OC10-T-1A Pre Spike (2)	-200 TM	8.2793	µg/mL	33.9	40.3	7.65	3.33
Percent Recovery				57%	68%	40%	77%
C-OC10-T-1A	+30 TM	8.4577	µg/g	2336	1232	358	103
C-OC10-T-2A	-200 TM	8.0088	µg/g	792	842	171	65.2
C-OC10-T-2A Duplicate	-200 TM	8.1277	µg/g	762	815	169	62.8
C-OC10-T-2A	+30 TM	8.7572	µg/g	2343	1265	366	110
C-OC10-T-1A Post Spike	-200 TM	8.0871	µg/g	30.7	37.1	7.66	3.49
Percent Recovery				-21%	60%	88%	84%
Spiking Solution			µg/mL	10.0	47.8	9.8	9.767
Percent Recovery				100%	96%	98%	98%
Check Standard			µg/mL	4.924	24.37	1.943	4.86
Percent Recovery				98%	97%	97%	97%
Blank			µg/mL	0.023	0.042	0.000	0.012

Oct. 21

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL	0.006	0.063	0.04	0.005
Check Standard			µg/mL	4.98	24.8	1.89	4.98
Percent Recovery				100%	99%	94%	100%
Calibration Verification Standard			µg/mL	2.42	12.0	1.01	2.46
Percent Recovery				97%	96%	101%	98%
Quantitation Limit Standard			µg/mL	0.4621	2.296	0.1897	0.5099
Percent Recovery				92%	92%	95%	102%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank 1	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank 2	TCLP		µg/mL	0.000	0.000	0.004	0.000
Method Blank 3	TCLP		µg/mL	0.000	0.000	0.003	0.000
C-OC10-T-1A	TCLP	99.9	µg/mL	11.2	21.3	0.124	2.14
C-OC12C+F-A	TCLP	100.2	µg/mL	18.8	39.3	0.184	3.09
C-OC12C+F-A	TCLP	101.7	µg/mL	22.0	51.0	0.164	3.43
C-C-OC12C+F-A Pre Spike	TCLP	101.7	µg/mL	11.8	30.1	0.179	2.20
Percent Recovery				84%	92%	195%	96%
C-C-OC12C+F-A Pre Spike	TCLP	101.7	µg/mL	12.0	30.5	0.106	2.23
Percent Recovery				102%	99%	48%	102%
C-OC12C+F-B	TCLP	100.3	µg/mL	22.2	51.1	0.100	3.39
C-OC12C+F-B	TCLP	100.5	µg/mL	22.1	50.7	0.124	3.34
C-OC10-T-2A	TCLP	101.1	µg/mL	11.3	21.5	0.227	2.63
C-OC12-P-1A	TCLP	100.0	µg/mL	0.200	262	0.344	9.67
C-OC10-T-1A Post Spike	TCLP	99.9	µg/mL	5.80	13.8	0.994	1.92
Percent Recovery				77%	85%	94%	95%
Spiking Solution			µg/mL	9.72	48.1	9.03	9.69
Percent Recovery				97%	96%	90%	97%
Check Standard			µg/mL	4.83	24.2	1.83	4.86
Percent Recovery				97%	97%	92%	97%
Blank				0.000	0.000	0.000	0.003
Method Blank 1	Soil			0.001	0.000	0.006	0.000
Method Blank 2	Soil			0.000	0.000	0.000	0.000
Method Blank 3	Soil			0.000	0.000	0.000	0.000
C-OC12C+F-A	-200 TM	8.0697	µg/g	762	1517	276	92.9
C-OC12C+F-A	-200 TM	8.1550	µg/g	769	1538	282	93.2
C-OC12C+F-A Pre Spike	-200 TM	8.3382	µg/g	859	1684	318	112
Percent Recovery				93%	76%	75%	100%
C-OC12C+F-A Pre Spike	-200 TM	8.3251	µg/g	856	1680	328	112
Percent Recovery				90%	74%	97%	96%
C-OC12C+F-A	+30 TM	8.0353	µg/g	1694	4864	491	277
C-OC12C+F-B	+30 TM	8.0361	µg/g	1285	3973	396	220
C-OC12C+F-B	-200 TM	8.3335	µg/g	680	1315	238	81.2
C-OC12C+F-B	-200 TM	8.3453	µg/g	673	1305	241	79.4
C-OC03-M-1A	-200 TM	7.7917	µg/g	1261	3749	46.8	237
Spiking Solution			µg/mL	9.64	47.5	9.36	9.62
Percent Recovery				96%	95%	94%	96%
Check Standard			µg/mL	4.70	23.5	1.89	4.75
Percent Recovery				94%	94%	94%	95%

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.01	0.103	0.023	0.003
Check Standard			µg/mL	4.98	24.7	1.95	4.98
Percent Recovery				100%	99%	98%	100%
Calibration Verification Standard			µg/mL	2.48	12.5	1.01	2.54
Percent Recovery				99%	100%	101%	102%
Quantitation Limit Standard			µg/mL	0.437	2.3	0.193	0.511
Percent Recovery				87%	92%	97%	102%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank 1	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank 2	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank 3	TCLP		µg/mL	0.000	0.000	0.000	0.000
C-OC02-Q-1A (1)	TCLP		µg/mL	21.6	631	5.46	39.5
C-OC02-Q-1A (2)	TCLP		µg/mL	21.4	622	4.70	38.9
C-OC02-Q-1A (3) Pre Spike	TCLP		µg/mL	22.2	625	5.07	39.1
Percent Recovery				82%	52%	744%	24%
Method Blank 1	Soil		µg/mL	0.222	1.13	0.000	0.017
Method Blank 2	Soil		µg/mL	0.030	0.000	0.000	0.014
Method Blank 3	Soil		µg/mL	0.000	0.000	0.000	0.011
C-SP25-T-1D	+30 TM	0.6572	µg/g	193	482	17.4	35.3
C-OC02-T-1D	+30 TM	0.9764	µg/g	371	66.6	12.3	40.6
C-OC02-T-1E	+30 TM	7.5134	µg/g	32.3	39.9	8.16	5.16
C-SP25-T-1E	+30 TM	0.2502	µg/g	91.9	83.9	2.40	25.2
C-SP25-T-1E Post Spike	+30 TM	0.2502	µg/mL	1.25	5.23	0.96	1.05
Percent Recovery				114%	103%	96%	102%
Spiking Solution			µg/mL	9.91	48.6	9.19	9.75
Percent Recovery				99%	97%	92%	98%
Check Standard			µg/mL	5.13	25.8	1.93	5.09
Percent Recovery				103%	103%	97%	102%
Blank				0.000	0.000	0.000	0.005
C-SP15-U-E1	+30 TM	2.8230	µg/g	467	7170	232	44.5
C-SP25-U-E1	+30 TM	8.0645	µg/g	1210	6205	260	154
C-SP21-U-E1	+30 TM	8.0758	µg/g	14413	2850	363	1448
C-SP25-U-1D	+30 TM	8.1708	µg/g	2577	17000	745	261
C-SP21-U-1D	+30 TM	8.2894	µg/g	36673	5028	282	4020
C-OC02-F-1A	-200 TM	8.1482	µg/g	1021	982	264	66.7
C-OC02-F-1A Duplicate	-200 TM	7.6230	µg/g	980	952	260	73.5
C-OC02-F-1A	+30 TM	8.1839	µg/g	961	807	240	91.3
C-OC02-F-1A Pre Spike	-200 TM	8.4054	µg/mL	85.7	87.3	19.4	7.47
Percent Recovery				61%	122%	-19%	-12%
Spiking Solution			µg/mL	9.29	45.0	7.43	8.95
Percent Recovery				93%	90%	74%	90%
Check Standard			µg/mL	4.80	23.7	1.59	4.68
Percent Recovery				96%	95%	80%	94%
Blank			µg/mL	0.005	0.000	0.000	0.006

Oct. 29

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL	0.015	0.062	0.018	0.003
heck Standard			µg/mL	4.98	25.0	1.99	4.98
ercent Recovery				100%	100%	100%	100%
alibration Verification Standard			µg/mL	2.43	12.2	0.98	2.45
ercent Recovery				97%	98%	98%	98%
uantitation Limit Standard			µg/mL	0.474	2.40	0.212	0.502
ercent Recovery				95%	96%	106%	100%
lank			µg/mL	0.000	0.000	0.000	0.003
-OC05-FB-1A	TCLP	101.2	µg/mL	0.000	0.000	0.009	0.132
-OC05-FB-1A Duplicate	TCLP	101.0	µg/mL	0.000	0.000	0.000	0.100
-OC02-C-1A	TCLP	100.2	µg/mL	18.2	6.97	0.030	2.59
-OC02-C-1A	TCLP	100.6	µg/mL	16.1	6.32	0.053	2.30
-OC02-C-1B	TCLP	100.6	µg/mL	16.1	6.64	0.023	2.42
-OC02-C-1B	TCLP	100.3	µg/mL	15.1	6.02	0.046	2.18
-OC03-M-1A	TCLP	100.9	µg/mL	6.94	18.3	0.156	1.20
-OC03-M-1A	TCLP	100.4	µg/mL	6.46	16.9	0.078	1.32
-OC07-Q-1A	TCLP		µg/mL	0.647	29.3	0.080	17.5
lethod Blank 1	Soil		µg/mL	0.095	0.179	0.000	0.005
lethod Blank 2	Soil		µg/mL	0.019	0.000	0.000	0.000
lethod Blank 3	Soil		µg/mL	0.000	0.000	0.000	0.000
-OC03-M-1A	-200 TM	8.1198	µg/g	219	447	50.6	30.5
-OC03-M-1A	-200 TM	8.2182	µg/g	224	481	56.7	31.1
-OC03-M-1A Pre Spike	-200 TM	8.2031	µg/mL	24.7	55.1	8.12	3.84
ercent Recovery				84%	115%	99%	84%
-OC02-C-1D	-200 TM	8.1838	µg/g	421	256	41.0	51.4
-OC02-C-1D	-200 TM	8.2905	µg/g	409	248	36.1	50.3
-OC02-C-1D	+30 TM	0.5224	µg/g	118	57.0	4.84	24.8
-OC02-C-1A Post Spike	TCLP	100.2	µg/mL	9.02	7.94	1.06	2.14
ercent Recovery				84%	96%	104%	97%
piking Solution			µg/mL	10.0	49.3	10.0	9.47
ercent Recovery				100%	99%	100%	95%
heck Standard			µg/mL	5.01	24.9	1.98	4.83
ercent Recovery				100%	100%	99%	97%
lank			µg/mL	0.000	0.000	0.000	0.004

Oct. 29B

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.01	0.049	0.044	0.005
Check Standard			µg/mL	5.06	25.2	2.02	5.06
Percent Recovery				101%	101%	101%	101%
Calibration Verification Standard			µg/mL	2.51	12.6	1.01	2.55
Percent Recovery				100%	101%	101%	102%
Quantitation Limit Standard			µg/mL	0.481	2.56	0.194	0.544
Percent Recovery				96%	102%	97%	109%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank 1	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank 2	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank 3	TCLP		µg/mL	0.000	0.000	0.000	0.000
C-OC11-O-1A	TCLP	100.1	µg/mL	1.52	610	4.22	1.49
C-OC11-O-1A	TCLP	100.3	µg/mL	2.97	630	2.88	1.65
C-OC04-T-1A Water Wash	TCLP	102.4	µg/mL	4.71	6.39	0.125	0.490
C-OC04-T-1A Water Wash	TCLP	100.3	µg/mL	4.76	6.23	0.090	0.573
C-OC04-T-1A WW Pre Spike	TCLP	100.3	µg/mL	7.06	17.1	0.212	1.72
Percent Recovery				94%	56%	67%	57%
C-OC04-T-1A WW Pre Spike	TCLP	100.3	µg/mL	7.03	17.1	0.200	1.72
Percent Recovery				93%	56%	62%	57%
C-OC02-T-1C WW	TCLP	100.7	µg/mL	6.82	8.94	0.048	0.972
C-OC02-T-1C WW	TCLP	101.5	µg/mL	6.21	8.63	0.035	0.784
C-OC02-T-1A pH 6.13	TCLP	100.3	µg/mL	4.71	7.10	0.072	0.815
C-OC02-T-1A pH 6.04	TCLP	100.0	µg/mL	3.47	5.71	0.065	0.524
C-OC02-T-1C pH 5.90	TCLP	100.0	µg/mL	5.86	8.45	0.148	1.18
C-OC02-T-1C pH 6.00	TCLP	100.7	µg/mL	7.16	9.59	0.114	1.14
Spiking Solution			µg/mL	11.0	53.1	10.6	10.7
Percent Recovery				110%	106%	106%	107%
Check Standard			µg/mL	5.19	25.6	2.09	5.15
Percent Recovery				104%	102%	105%	103%
Blank			µg/mL	0.000	0.044	0.000	0.000

Nov. 5

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.008	0.051	0.035	0.005
Check Standard			µg/mL	4.964	24.17	1.95	4.888
Percent Recovery				99%	97%	98%	98%
Calibration Verification Standard			µg/mL	2.478	12.08	0.9995	2.458
Percent Recovery				99%	97%	100%	98%
Quantitation Limit Standard			µg/mL	0.4923	2.413	0.2087	0.5186
Percent Recovery				98%	97%	104%	104%
Blank			µg/mL	-0.0076	-0.1005	-0.0189	0.0018
Method Blank	TCLP		µg/mL	-0.0488	-0.1906	-0.0205	-0.0194
Method Blank	TCLP		µg/mL	-0.048	-0.2224	-0.0158	-0.0221
Method Blank	TCLP		µg/mL	-0.0508	-0.2352	-0.0241	-0.0218
C-OC02-U-1B	TCLP	100.1	µg/mL	0.8382	111.08	2.172	0.2626
C-OC02-U-1B	TCLP	100.6	µg/mL	0.5324	32.92	0.4494	0.294
C-OC02-U-1A	TCLP	102.0	µg/mL	0.4298	7.992	0.0318	0.3884
C-OC02-U-1A	TCLP	101.1	µg/mL	0.4464	9.924	0.0276	0.2282
C-OC11-U-1B	TCLP	101.3	µg/mL	1.8922	83.66	0.3212	0.4178
C-OC11-U-1B	TCLP	101.5	µg/mL	1.3186	98.18	0.4838	0.3822
C-OC11-U-1A	TCLP	101.2	µg/mL	8.834	152	1.249	0.891
C-OC11-U-1A	TCLP	100.9	µg/mL	1.1712	91.74	0.6318	0.5976
C-OC05-FB-1A	TCLP	100.5	µg/mL	-0.0846	-0.2674	-0.0156	0.014
C-OC05-FB-1A	TCLP	102.1	µg/mL	0.1666	0.2266	-0.0082	0.4192
C-OC05-FB-1A	TCLP	102.1	µg/mL	0.172	0.2516	-0.018	0.4186
C-OC11-U-1A Post Spike	TCLP	100.9	µg/mL	1.53	45.4	1.23	1.28
Percent Recovery				101%	82%	95%	101%
Spiking Solution			µg/mL	9.96	48.6	9.61	9.60
Percent Recovery				100%	97%	96%	96%
Check Standard			µg/mL	5.01	24.4	1.90	4.91
Percent Recovery				100%	98%	95%	98%
Blank			µg/mL	0.019	0.011	0.000	0.010
C-OC10-T-3A	TCLP	101.5	µg/mL	9.85	18.4	0.108	1.42
C-OC10-T-3A	TCLP	100.2	µg/mL	9.30	17.3	0.114	1.25
C-OC10-T-3A Pre Spike	TCLP	100.2	µg/mL	11.3	26.8	0.187	2.29
Percent Recovery				133%	72%	52%	67%
C-OC10-T-3A Pre Spike	TCLP	100.2	µg/mL	11.4	26.9	0.193	2.29
Percent Recovery				134%	73%	55%	67%
Method Blank	Soil		µg/mL	0.100	0.116	0.000	0.015
Method Blank	Soil		µg/mL	0.029	0.000	0.000	0.011
Method Blank	Soil		µg/mL	0.004	0.000	0.000	0.006
C-OC11-U-1D-1	-200 TM	8.1531	µg/g	136	1533	88.7	31.4
C-OC11-U-1D-2	-200 TM	8.0783	µg/g	130	1622	87.4	30.3
C-OC11-U-1D-3 Pre Spike	-200 TM	8.0489	µg/mL	18.2	150	10.3	4.03
Percent Recovery				90%	166%	79%	94%
C-OC11-U-1D-3 Pre Spike	-200 TM	8.0489	µg/mL	18.3	143	10.4	4.06
Percent Recovery				91%	122%	81%	96%
C-OC11-U-1D	+30 TM	2.1401	µg/g	12570	47474	1505	1248
C-OC02--U-1E-1	-200 TM	7.9560	µg/g	71.5	447	37.2	10.5
C-OC02--U-1E-2	-200 TM	8.1622	µg/g	71.7	432	36.4	21.2

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-OC02-U1-E1	+30 TM	8.1255	µg/g	2523	9612	546	208
C-OC02-U1-E2	+30 TM	1.8979	µg/g	3056	9010	648	293
C-OC02--U-1E-1 Post Spike	-200 TM	7.9560	µg/mL	3.46	20.7	2.27	1.59
Percent Recovery				62%	58%	79%	117%
Spiking Solution			µg/mL	9.863	47.9	9.042	9.657
Percent Recovery				99%	96%	90%	97%
Check Standard			µg/mL	4.931	24.11	1.826	4.908
Percent Recovery				99%	96%	91%	98%
Blank			µg/mL	0.0338	0.0882	-0.0157	0.0157

Nov. 7

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.054	25.41	1.959	5.022
Percent Recovery				101%	102%	98%	100%
Calibration Verification Standard			µg/mL	2.88	14.5	1.01	2.89
Percent Recovery				115%	116%	101%	116%
Quantitation Limit Standard			µg/mL	0.433	2.23	0.145	0.481
Percent Recovery				87%	89%	72%	96%
Blank			µg/mL	0.008	0.000	0.000	0.012
Method Blank 1	TCLP		µg/mL	0.000	0.000	0.000	0.006
Method Blank 2	TCLP		µg/mL	0.000	0.000	0.000	0.014
Method Blank 3	TCLP		µg/mL	0.000	0.000	0.000	0.008
Lab Blank 1	TCLP	100.2	µg/mL	0.000	0.000	0.000	0.056
Lab Blank 2	TCLP	100.9	µg/mL	0.000	0.000	0.000	0.064
C-OCO2-L-1A	TCLP	100.6	µg/mL	10.4	44.6	0.032	4.34
C-OCO2-L-1A	TCLP	101.7	µg/mL	10.5	44.9	0.052	4.29
C-OC02-L-1A Pre Spike	TCLP	101.7	µg/mL	6.34	28.2	0.109	2.72
Percent Recovery				111%	115%	166%	115%
C-OC02-L-1A Pre Spike	TCLP	101.7	µg/mL	6.46	28.8	0.061	2.77
Percent Recovery				123%	128%	69%	124%
C-OC02-L-1A Post Spike	TCLP	100.6	µg/mL	5.75	25.2	1.06	3.05
Percent Recovery				107%	102%	105%	109%
Spiking Solution			µg/mL	11.1	54.5	9.64	10.6
Percent Recovery				111%	109%	96%	106%
Check Standard			µg/mL	5.27	27.0	1.94	5.24
Percent Recovery				105%	108%	97%	105%
Blank			µg/mL	0.033	0.000	0.000	0.028
Method Blank 1			µg/mL	0.077	0.000	0.000	0.034
Method Blank 2			µg/mL	0.031	0.000	0.000	0.027
Method Blank 3			µg/mL	0.024	0.000	0.000	0.029
C-OC11-U-1E	-200 TM	8.4528	µg/g	192	1492	81.7	38.7
C-OC11-U-1E	-200 TM	8.1248	µg/g	154	1492	84.6	35.1
C-OC11-U-1E Pre Spike	-200 TM	8.0874	µg/mL	10.6	68.7	4.92	2.33
Percent Recovery				70%	105%	80%	95%
C-OC11-U-1E	+30 TM	8.8716	µg/g	10517	11125	579	1150
Lab Blank	-200 TM	8.2928	µg/g	21.3	15.0	0.241	2.34
Lab Blank	-200 TM	7.9746	µg/g	7.74	9.17	0.416	1.95
Lab Blank	-200 TM	8.1316	µg/g	5.74	8.37	0.283	1.76
Lab Blank	-200 TM	8.3166	µg/g	4.80	7.54	0.364	1.67
Lab Blank Duplicate	-200 TM	7.9746	µg/g	4.94	8.01	0.863	1.79
Relative Percent Difference				44%	13%	70%	8%
Lab Blank Post Spike	-200 TM	8.2928	µg/mL	1.25	4.89	0.891	0.988
Percent Recovery				35%	75%	87%	81%
Spiking Solution			µg/mL	11.2	55.3	9.56	10.8
Percent Recovery				112%	111%	96%	108%
Check Standard			µg/mL	5.25	27.2	1.884	5.22
Percent Recovery				105%	109%	94%	104%
Blank			µg/mL	0.012	0.000	0.000	0.025

Nov. 8

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.06	25.2	2.01	5.04
Percent Recovery				101%	101%	101%	101%
Calibration Verification Standard			µg/mL	2.58	12.8	0.98	2.61
Percent Recovery				103%	102%	98%	104%
Quantitation Limit Standard			µg/mL	0.435	2.17	0.065	0.504
Percent Recovery				87%	87%	32%	101%
Blank			µg/mL	0.000	0.000	0.000	0.000
C-OC11-U-1E	-200 TM	8.4928	µg/g	163	1281	61.9	31.3
C-OC11-U-1E	-200 TM	8.1248	µg/g	172	1681	85.5	38.1
C-OC11-U-1E Pre Spike	-200 TM	8.0874	µg/mL	1.89	12.3	0.887	0.409
Percent Recovery				71%	118%	97%	98%
C-OC11-U-1E	+30 TM	8.8716	µg/g	12563	12174	547	1330
C-OCO2-L-1A	TCLP	100.6	µg/mL	10.5	42.5	NA	4.25
C-OCO2-L-1A	TCLP	101.7	µg/mL	13.7	56.1	NA	5.56
C-OC02-L-1A Pre Spike	TCLP	101.7	µg/mL	15.0	64.4	NA	6.40
Percent Recovery				164%	146%		145%
Spiking Solution			µg/mL	10.2	50.7	9.96	11.0
Percent Recovery				102%	101%	100%	110%
Check Standard			µg/mL	4.90	24.4	1.97	4.89
Percent Recovery				98%	98%	99%	98%
Blank			µg/mL	0.000	0.000	0.000	0.000

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.004	0.105	0.054	0.005
Check Standard			µg/mL	5.00	25.1	1.97	4.99
Percent Recovery				100%	100%	99%	100%
Calibration Verification Standard			µg/mL	2.52	12.6	1.00	2.54
Percent Recovery				101%	101%	100%	102%
Quantitation Limit Standard			µg/mL	0.478	2.45	0.202	0.511
Percent Recovery				96%	98%	101%	102%
Blank			µg/mL	0.000	0.001	0.000	0.001
Method Blank (1)	Soil		µg/mL	0.036	0.011	0.000	0.019
Method Blank (2)	Soil		µg/mL	0.015	0.000	0.000	0.017
Method Blank (3)	Soil		µg/mL	0.002	0.000	0.000	0.014
C-OC05-FB-1A (1)	-200 TM	8.4130	µg/g	13.4	3.23	0.521	7.81
C-OC05-FB-1A (2)	-200 TM	8.0317	µg/g	9.88	2.18	0.102	6.74
C-OC05-FB-1A (3) Pre Spike	-200 TM	9.0137	µg/mL	8.97	15.6	3.98	2.31
Percent Recovery				97%	96%	98%	100%
C-OC05-FB-1A (4) Pre Spike	-200 TM	8.1400	µg/mL	9.50	16.5	4.18	2.40
Percent Recovery				105%	101%	103%	110%
C-OC05-FB-1A	+30 TM	2.7426	µg/g	0.000	0.000	0.000	13.0
C-SP25-U-1D	+30 TM	0.9425	µg/g	1004	628	1.91	110
C-OC12(C+F)A (1)	+30 TM	8.7783	µg/g	3028	5946	510	416
C-OC12(C+F)A (2)	+30 TM	8.5429	µg/g	1847	5154	518	300
C-OC12(C+F)B	+30 TM	3.6057	µg/g	2757	5297	563	413
Raw Sand (1)	-200 TM	8.7402	µg/g	2.30	8.02	1.21	170
C-OC05-FB-1A (1) Post Spike	-200 TM	8.4130	µg/mL	1.32	4.41	0.848	1.21
Percent Recovery				76%	85%	83%	88%
Spiking Solution			µg/mL	10.2	51.1	9.57	11.0
Percent Recovery				102%	102%	96%	110%
Check Standard			µg/mL	5.02	25.5	1.99	5.01
Percent Recovery				100%	102%	100%	100%
Blank			µg/mL	0.003	0.005	0.000	0.014

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.004	0.062	0.048	0.004
Check Standard			µg/mL	5.04	25.0	2.03	5.01
Percent Recovery				101%	100%	102%	100%
Calibration Verification Standard			µg/mL	2.56	12.7	1.00	2.56
Percent Recovery				102%	102%	100%	102%
Quantitation Limit Standard			µg/mL	0.499	2.49	0.206	0.524
Percent Recovery				100%	100%	103%	105%
Blank			µg/mL	0.000	0.002	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.036	0.021	0.008	0.011
Method Blank (2)	Soil		µg/mL	0.017	0.000	0.000	0.010
Method Blank (3)	Soil		µg/mL	0.009	0.000	0.000	0.007
C-OC10-T-2A (1)	+30 TM	8.2849	µg/g	2296	989	324	101
C-OC10-T-2A (2)	+30 TM	7.0757	µg/g	1658	603	194	88.3
C-OC10-T-2A (3)	+30 TM	6.3034	µg/g	2150	1048	406	103
C-OC10-T-1A (1)	+30 TM	9.2889	µg/g	2321	999	323	96.4
C-OC10-T-1A (2)	+30 TM	3.3558	µg/g	812	413	129	45.1
C-SP25-U-1E (1)	+30 TM	9.4876	µg/g	1356	7958	364	152
C-SP25-U-1E (2)	+30 TM	4.5697	µg/g	904	5981	231	101
C-SP21-U-1E	+30 TM	9.9248	µg/g	27129	11814	1192	3118
Raw Sand (2)	-200 TM	8.3788	µg/g	1.92	22.6	0.353	2.05
C-OC10-T-2A (1) Post Spike	+30 TM	8.2849	µg/mL	4.90	40.7	3.56	4.66
Percent Recovery				-9021%	-5%	-986%	48%
Spiking Solution			µg/mL	9.6	48.4	9.84	10.5
Percent Recovery				96%	97%	98%	105%
Check Standard			µg/mL	5.05	24.7	1.98	4.94
Percent Recovery				101%	99%	99%	99%
Blank			µg/mL	0.118	0.100	0.000	0.013

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.041	0.058	0.076	0.004
Check Standard			µg/mL	5.06	25.2	1.99	5.02
Percent Recovery				101%	101%	100%	100%
Calibration Verification Standard			µg/mL	2.52	12.6	0.98	2.55
Percent Recovery				101%	101%	98%	102%
Quantitation Limit Standard			µg/mL	0.460	2.47	0.183	0.521
Percent Recovery				92%	99%	92%	104%
Blank			µg/mL	0.000	0.015	0.004	0.000
Method Blank (1)	Soil		µg/mL	0.073	0.040	0.000	0.022
Method Blank (2)	Soil		µg/mL	0.049	0.000	0.000	0.022
Method Blank (3)	Soil		µg/mL	0.012	0.000	0.000	0.015
C-OC02-F-1A (1)	+30 TM	9.0296	µg/g	1036	732	304	86.6
C-OC02-F-1A (2)	+30 TM	8.7067	µg/g	1004	722	301	84.2
C-OC02-F-1A (3)	+30 TM	8.0148	µg/g	999	705	322	84.9
C-OC02-F-1A (4)	+30 TM	8.6064	µg/g	1064	702	305	82.4
C-OC02-F-1A (5)	+30 TM	8.6508	µg/g	975	689	306	84.8
C-OC02-F-1A (6)	+30 TM	8.1754	µg/g	1024	680	304	79.8
C-OC02-F-1A (7)	+30 TM	5.6233	µg/g	968	744	318	88.7
C-SP21-U-1D (1)	+30 TM	8.0724	µg/g	11547	6999	102	1828
C-SP21-U-1D (2)	+30 TM	8.2050	µg/g	109287	7087	208	12212
C-SP21-U-1D (3)	+30 TM	4.6908	µg/g	3092	16319	2958	344
Raw Sand (1)	+30 TM	8.0299	µg/g	25.5	25.1	0.420	1.56
Raw Sand (2)	+30 TM	8.1903	µg/g	16.5	6.50	0.249	1.28
C-OC02-F-1A (1) Post Spike	+30 TM	9.0296	µg/mL	3.05	37.0	3.80	4.80
Percent Recovery				211%	175%	-910%	140%
Spiking Solution			µg/mL	10.2	50.2	9.64	10.8
Percent Recovery				102%	100%	96%	108%
Check Standard			µg/mL	5.29	24.4	1.95	4.96
Percent Recovery				106%	98%	98%	99%
Blank			µg/mL	0.301	0.165	0.000	0.017

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.00	25.0	2.05	4.977
Percent Recovery				100%	100%	102%	100%
Calibration Verification Standard			µg/mL	2.46	12.6	1.03	2.48
Percent Recovery				99%	101%	103%	99%
Quantitation Limit Standard High				0.9126	5.051	0.404	0.939
				91%	101%	101%	94%
Quantitation Limit Standard Low			µg/mL	0.393	2.52	0.211	0.420
Percent Recovery				79%	101%	106%	84%
Blank			µg/mL	0.000	0.001	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.775	0.091	0.005	0.061
Method Blank (2)	Soil		µg/mL	0.564	0.046	0.000	0.000
C-OC12-P-1A	-200 TM	8.0281	µg/g	2480	7862	553	338
C-OC12-P-1A	-200 TM	7.6911	µg/g	2509	7955	547	336
C-OC02-L-1A	-200 TM	8.0297	µg/g	692	1527	231	122
C-OC02-L-1A	-200 TM	8.1519	µg/g	704	1548	279	122
C-OC02-U-1D	-200 TM	8.0291	µg/g	82.1	457	45.1	19.9
C-OC02-U-1D	-200 TM	8.0204	µg/g	80.0	459	46.2	18.9
C-OC12-P-1A	-200 TM	8.0281	µg/g	2607	8746	576	352
C-OC12-P-1A	-200 TM	8.0281	µg/g	2856	10055	657	277
C-OC12-P-1A	-200 TM	7.6911	µg/g	2623	8792	573	353
C-OC12-P-1A	-200 TM	7.6911	µg/g	2816	9901	646	266
C-OC02-L-1A	-200 TM	8.0297	µg/g	709	16627	239	118
C-OC02-L-1A	-200 TM	8.1519	µg/g	709	1684	288	118
Spiking Solution			µg/mL	10.1	50.7	10.1	10.1
Percent Recovery				101%	101%	101%	101%
Check Standard			µg/mL	5.07	25.3	2.036	4.98
Percent Recovery				101%	101%	102%	100%
Blank			µg/mL	0.006	0.048	0.000	0.000

March 25

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL				
:heck Standard			µg/mL	5.02	25.0	1.99	5.02
'ercent Recovery				100%	100%	100%	100%
:alibration Verification Standard			µg/mL	2.57	12.9	1.04	2.59
'ercent Recovery				103%	103%	104%	104%
ɿuantitation Limit Standard High				1.01	5.19	0.415	1.05
'ercent Recovery				101%	104%	104%	105%
ɿuantitation Limit Standard Low			µg/mL	0.497	2.67	0.215	0.531
'ercent Recovery				99%	107%	107%	106%
3lank			µg/mL	0.025	0.011	0.001	0.009
:-SP15-T-1A	TCLP	100.4	µg/mL	0.718	3.04	0.028	0.417
:-SP15-T-1A	TCLP	100.4	µg/mL	0.725	3.04	0.039	0.411
:-SP15-T-1A Pre Spike	TCLP	100.4	µg/mL	1.605	6.15	0.036	0.719
'ercent Recovery				110%	104%	-2%	128%
:-SP21-T-X1	TCLP	100.1	µg/mL	1.90	7.39	0.072	0.538
:-SP21-T-X1 Post Spike	TCLP	100.1	µg/mL	1.92	8.32	1.08	1.28
'ercent Recovery				107%	100%	105%	104%
:-OC04-T-1A WW	TCLP	100.3	µg/mL	4.39	6.17	0.114	0.541
:-OC04-T-1A WW Pre Spike	TCLP	100.3	µg/mL	6.53	16.42	0.195	1.623
'ercent Recovery				87%	53%	55%	54%
:-OC04-T-1A WW Pre Spike	TCLP	100.3	µg/mL	6.55	16.62	0.220	1.629
'ercent Recovery				87%	54%	65%	54%
:heck Standard			µg/mL	5.22	25.4	2.02	5.10
'ercent Recovery				104%	102%	101%	102%
3lank			µg/mL	0.048	0.034	0.002	0.009
ʌethod Blank (1) 01-05-97	Soil		µg/mL	0.032	0.005	0.000	0.000
ʌethod Blank (2) 01-05-97	Soil		µg/mL	0.000	0.000	0.000	0.000
ʌethod Blank (3) 01-05-97	Soil		µg/mL	0.000	0.000	0.000	0.000
ʌethod Blank (1) 01-07-97	Soil		µg/mL	0.000	0.000	0.000	0.000
ʌethod Blank (2) 01-07-97	Soil		µg/mL	0.000	0.000	0.000	0.000
ʌethod Blank (3) 01-07-97	Soil		µg/mL	0.000	0.000	0.000	0.000
ʌethod Blank (1) 01-08-97	Soil		µg/mL	0.000	0.000	0.000	0.000
ʌethod Blank (2) 01-08-97	Soil		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3) 01-08-97	Soil		µg/mL	0.000	0.000	0.000	0.000
C-OC10-T-1A	Soil	8.0871	µg/g	747	810	164	64.4
C-OC10-T-1A Pre Spike	Soil	8.0908	µg/mL	34.7	40.4	7.81	3.40
Percent Recovery				111%	96%	58%	99%
C-OC10-T-1A Pre Spike	Soil	8.2793	µg/mL	35.4	41.4	7.78	3.46
Percent Recovery				112%	99%	49%	100%
C-OC10-T-1A Post Spike	Soil	8.0871	µg/mL	31.7	37.7	7.66	3.62
Percent Recovery				145%	99%	103%	102%
Spiking Solution			µg/mL	10.6	51.4	10.1	10.3
Percent Recovery				106%	103%	101%	103%
Check Standard			µg/mL	5.22	25.7	2.05	5.14
Percent Recovery				104%	103%	102%	103%
Blank			µg/mL	0.096	0.080	0.000	0.016
C-OC10-T-1A	Soil	8.0871	µg/g	769	850	170	66.4

March 25

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
C-OC10-T-1A Pre Spike	Soil	8.0908	µg/mL	7.15	8.52	1.62	0.701
Percent Recovery				116%	102%	61%	102%
C-OC10-T-1A Pre Spike	Soil	8.2793	µg/mL	7.34	8.77	1.61	0.719
Percent Recovery				122%	108%	49%	106%
Spiking Solution			µg/mL	10.6	51.2	10.1	10.3
Percent Recovery				106%	102%	101%	103%
Check Standard			µg/mL	5.10	25.3	2.03	5.07
Percent Recovery				102%	101%	101%	101%
Blank			µg/mL	0.066	0.050	0.000	0.015

April 2

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL				
heck Standard			µg/mL	5.16	24.7	2.12	5.26
ercent Recovery				103%	99%	106%	105%
alibration Verification Standard			µg/mL	2.60	12.5	1.07	2.67
ercent Recovery				104%	100%	107%	107%
uantitation Limit Standard High				1.05	5.13	0.444	1.10
ercent Recovery				105%	103%	111%	110%
uantitation Limit Standard Low			µg/mL	0.509	2.29	0.198	0.548
ercent Recovery				102%	92%	99%	110%
lank			µg/mL	0.000	0.064	0.000	0.000
lethod Blank (1)	TCLP		µg/mL	0.000	0.033	0.000	0.000
lethod Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
-OC04-T-1A WW	TCLP	100.3	µg/mL	3.73	5.52	0.172	0.480
-OC04-T-1A WW Pre Spike	TCLP	100.3	µg/mL	2.98	8.60	0.125	0.839
ercent Recovery				112%	117%	78%	120%
-OC04-T-1A WW	TCLP	102.4	µg/mL	4.09	6.32	0.133	0.509
-OC04-T-1A WW Pre Spike	TCLP	102.4	µg/mL	3.00	8.51	0.106	0.783
ercent Recovery				96%	107%	79%	106%
-OC10-T-3A	TCLP	100.2	µg/mL	8.97	20.2	0.132	1.37
-OC10-T-3A Pre Spike	TCLP	100.2	µg/mL	5.49	15.5	0.116	1.24
ercent Recovery				100%	107%	101%	111%
-OC10-T-3A	TCLP	101.5	µg/mL	8.50	19.2	0.130	1.37
-OC10-T-3A Pre Spike	TCLP	101.5	µg/mL	5.33	15.2	0.081	1.26
ercent Recovery				108%	111%	32%	114%
-OC04-T-1A WW Duplicate	TCLP	100.3	µg/mL	4.29	6.68	0.168	0.599
PD				14%	19%	2.4%	22%
-OC10-T-3A Duplicate	TCLP	100.2	µg/mL	9.06	20.200	0.182	1.37
PD				1.0%	0.10%	32%	0.01%
-OC04-T-1A WW Post Spike	TCLP	100.3	µg/mL	3.00	8.31	1.17	1.38
ercent Recovery				116%	112%	110%	115%
heck Standard			µg/mL	5.72	28.4	2.25	5.83
ercent Recovery				114%	113%	112%	117%
lank			µg/mL	0.000	0.079	0.000	0.010

RCRA Metals

Sample ID	Matrix	Weight g	Units	Silver	Arsenic	Barium	Cadmium	Chromiu	Lead	Selenium	Mercury µg/L
Instrument Detection Limit			µg/mL	0.019	0.311	0.009	0.007	0.007	0.077	0.146	0.007
Check Standard			µg/mL	0.99	4.7	1.00	1.01	1.02	25.1	2.09	2.54
Percent Recovery				99%	94%	100%	101%	102%	100%	105%	102%
Calibration Verification Standard			µg/mL	0.52	2.5	0.51	0.52	0.51	12.8	1.09	7.66
Percent Recovery				104%	100%	102%	104%	102%	102%	109%	102%
Quantitation Limit Standard 1			µg/mL	0.190	0.910	0.206	0.210	0.210	5.10	0.361	NA
Percent Recovery				95%	91%	103%	105%	105%	102%	90%	
Quantitation Limit Standard 2			µg/mL	0.096	0.39	0.110	0.103	0.110	2.52	0.128	NA
Percent Recovery				96%	78%	110%	103%	110%	101%	64%	
Blank			µg/mL	0.096	0.019	0.004	0.002	0.010	0.023	0.044	3.50
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.004	0.001	0.009	0.000	0.000	0.04
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.004	0.000	0.009	0.000	0.000	0.15
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.002	0.002	0.010	0.000	0.000	0.17
C-SP21-U-1A	TCLP	101.4	µg/mL	0.000	0.034	0.873	0.000	0.024	17.6	0.000	5.00
C-SP21-U-1A	TCLP	100.8	µg/mL	0.000	0.000	0.559	0.000	0.018	20.9	0.000	3.00
C-SP21-U-1A Pre Spike	TCLP	100.8	µg/mL	0.000	0.000	0.282	0.000	0.008	15.6	0.000	1.00
Percent Recovery				NA	NA	NA	NA	NA		NA	NA
C-SP21-U-1A Pre Spike	TCLP	100.8	µg/mL	0.000	0.019	0.284	0.000	0.017	15.7	0.000	2.00
Percent Recovery				NA	NA	NA	NA	NA		NA	NA
C-OC03-M-1A	TCLP	100.9	µg/mL	0.000	0.024	0.488	0.000	0.066	18.5	0.000	1.50
C-OC03-M-1A	TCLP	100.4	µg/mL	0.000	0.027	0.706	0.000	0.061	17.1	0.015	1.00
C-OC07-P-1A	TCLP	101.8	µg/mL	0.000	0.034	1.03	0.010	0.168	328	0.000	1.50
C-OC07-P-1A	TCLP	101.4	µg/mL	0.000	0.193	1.06	0.012	0.212	323	0.000	1.00
Check Standard			µg/mL	0.95	4.8	0.99	1.01	1.01	25.0	2.01	2.54
Percent Recovery				99%	94%	100%	101%	102%	100%	105%	102%
Blank			µg/mL	0.000	0.037	0.006	0.002	0.013	0.044	0.000	1.00
C-SP21-U-1A Post Spike	TCLP	101.4	µg/mL	0.142	0.827	0.558	0.181	0.193	12.1	0.961	NA
Percent Recovery				71%	81%	82%	90%	91%	84%	99%	
Spiking Solution			µg/mL	2.12	10.0	1.96	2.00	2.00	49.1	10.6	NA
Percent Recovery				106%	100%	98%	100%	100%	98%	106%	
Check Standard			µg/mL	0.95	4.9	1.01	1.01	1.19	25.0	2.16	7.71
Percent Recovery				99%	94%	100%	101%	102%	100%	105%	103%
Blank			µg/mL	0.071	0.048	0.005	0.003	0.056	0.073	0.046	2.50

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QA Data Summary

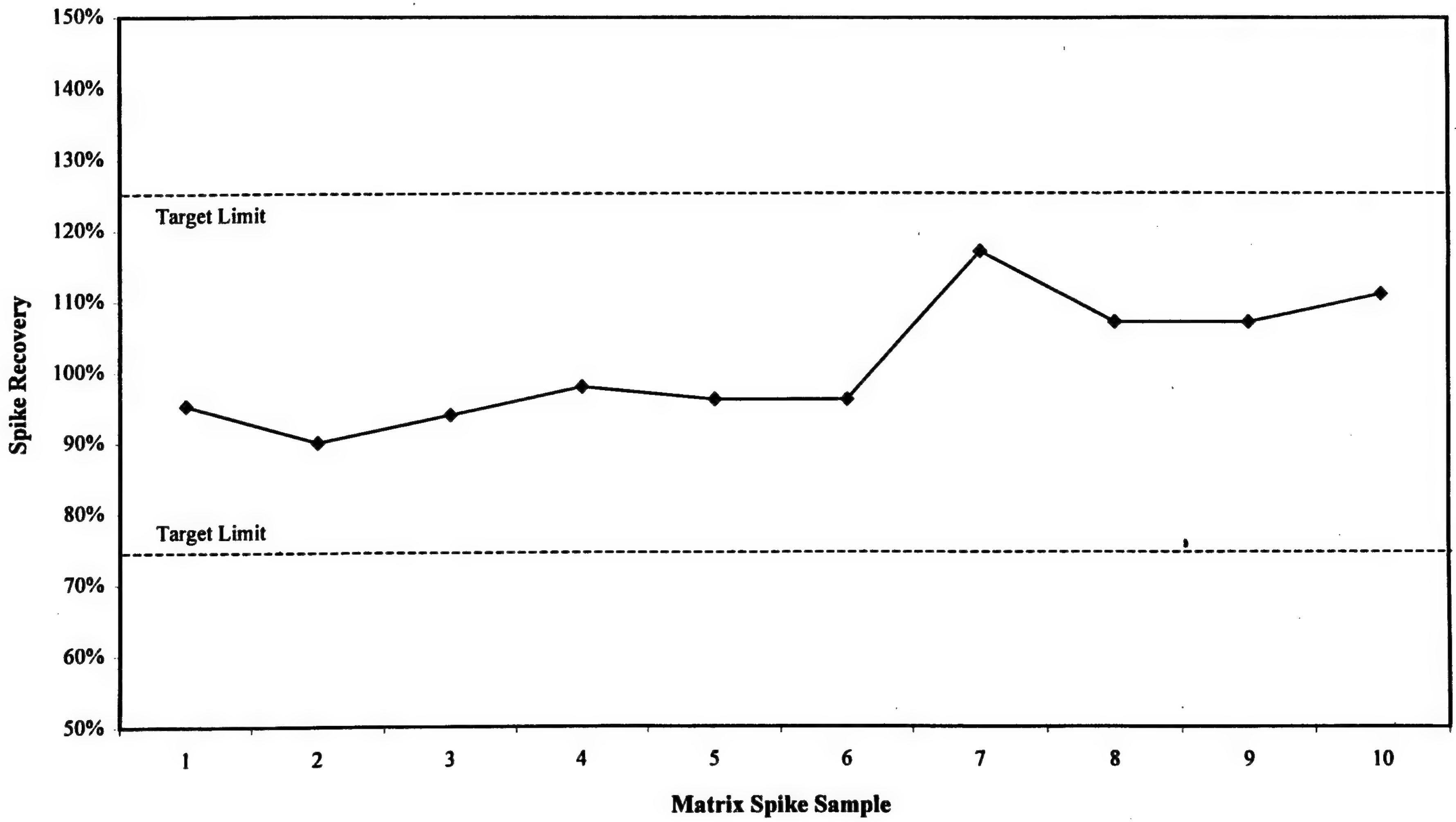
TCLP Matrix Spike Recovery - Vendor 1 (Acetic Acid Process)

	Date	Matrix	Copper	Lead	Antimon	Zinc	Comment
1	20-Sep-96	Treated	107%	95%	15%	110%	Antimony was not spiked into sample.
2	07-Oct-96	Treated	101%	90%	129%	106%	Antimony concentration very low.
3	14-Oct-96	P	100%	106%	151%	101%	Antimony concentration very low.
4		P	102%	106%	104%	109%	
5	08-Oct-96	F	57%	48%	62%	48%	Inappropriate spike level, sample concentrations very high.
6	10-Oct-96	Treated	101%	94%	111%	102%	
7		Treated	108%	98%	64%	106%	
8	16-Oct-96	Treated	105%	96%	205%	104%	Inappropriate spike level, sample concentrations very high.
9		Treated	104%	96%	132%	103%	Inappropriate spike level, sample concentrations very high.
10	21-Oct-96	F	84%	92%	195%	96%	
11		F	102%	99%	48%	102%	
12	22-Oct-96	Q	82%	52%	744%	24%	Inappropriate spike level, sample concentrations very high.
13	29-Oct-96	WW Treate	112%	117%	78%	120%	Reanalysis April 3, 1997
14		WW Treate	96%	107%	79%	106%	Reanalysis April 3, 1997
15	05-Nov-96	Treated	100%	107%	101%	111%	Reanalysis April 3, 1997
16		Treated	108%	111%	32%	114%	Reanalysis April 3, 1997
17	07-Nov-96	L	111%	115%	166%	115%	
18		L	123%	128%	69%	124%	
19	08-Nov-96	L	164%	146%		145%	

TCLP Analytical Spike Recovery - Vendor 1 (Acetic Acid Process)

	Date	Matrix	Copper	Lead	Antimon	Zinc	Comment
1	20-Sep-96	Treated	104%	100%	106%	106%	
2	26-Sep-96	Treated	102%	99%	105%	105%	
3	27-Sep-96	Treated	104%	97%	106%	105%	
4	28-Sep-96	Treated	105%	99%	105%	106%	
5	05-Oct-96	Treated	94%	95%	103%	103%	
6	07-Oct-96	Treated	104%	99%	103%	108%	
7	14-Oct-96	P	99%	87%	105%	104%	
8	08-Oct-96	F	58%	76%	107%	98%	
9	10-Oct-96	Treated	99%	92%	99%	100%	
10	16-Oct-96	P	111%	-682%	71%	-562%	
11		Treated	98%	93%	105%	101%	
12	21-Oct-96	Treated	77%	85%	94%	95%	
13	29-Oct-96	C	84%	96%	104%	97%	
		Treated	116%	112%	110%	115%	Reanalysis April 3, 1997
14	05-Nov-96	M	101%	82%	95%	101%	
15	07-Nov-96	L	107%	102%	105%	109%	

TCLP Matrix Spike Recovery - Vendor 1 (Acetic Acid Process)
Lead



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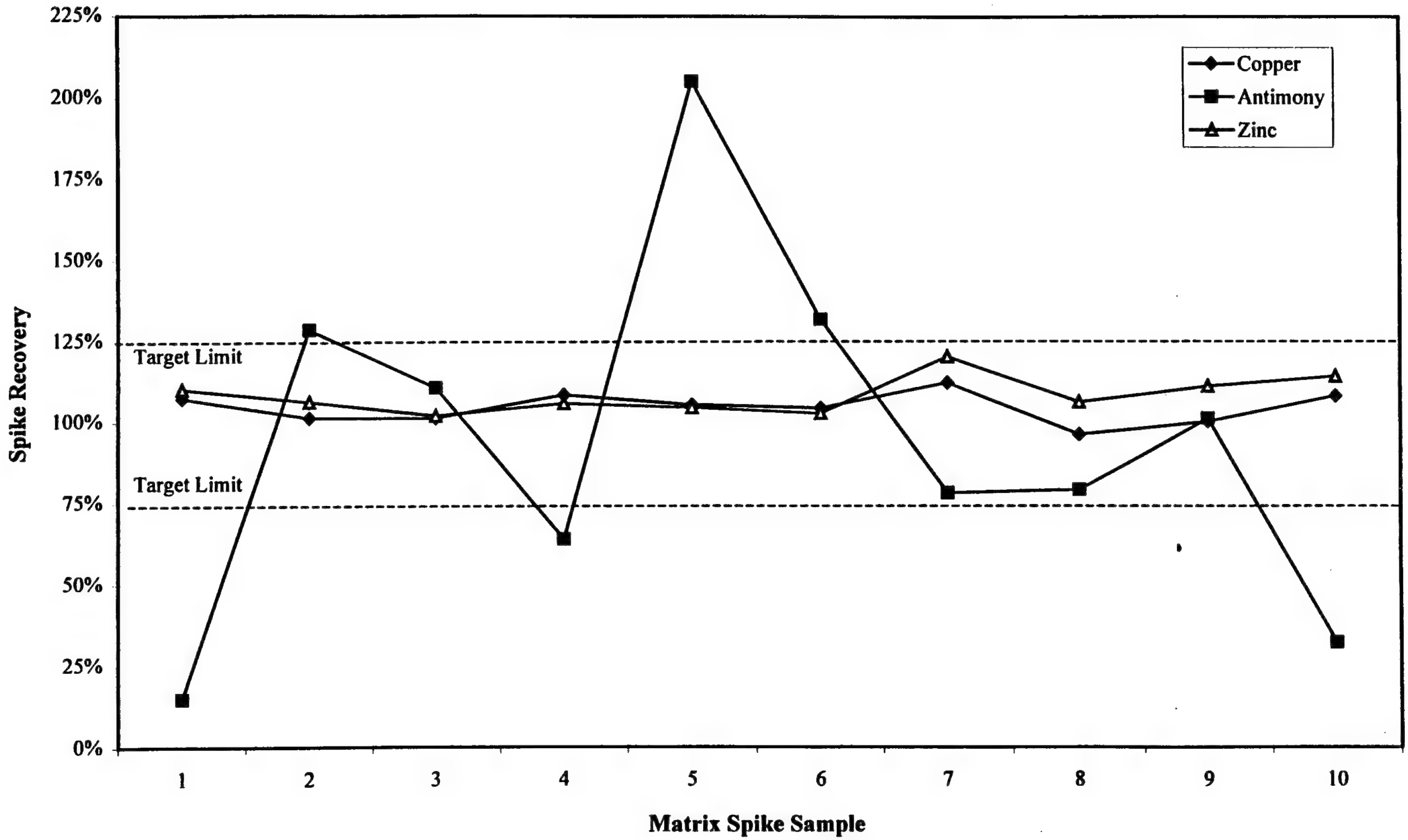
TCLP Matrix Spike Recovery - Vendor 1 (Acetic Acid Process)
Copper, Antimony and Zinc



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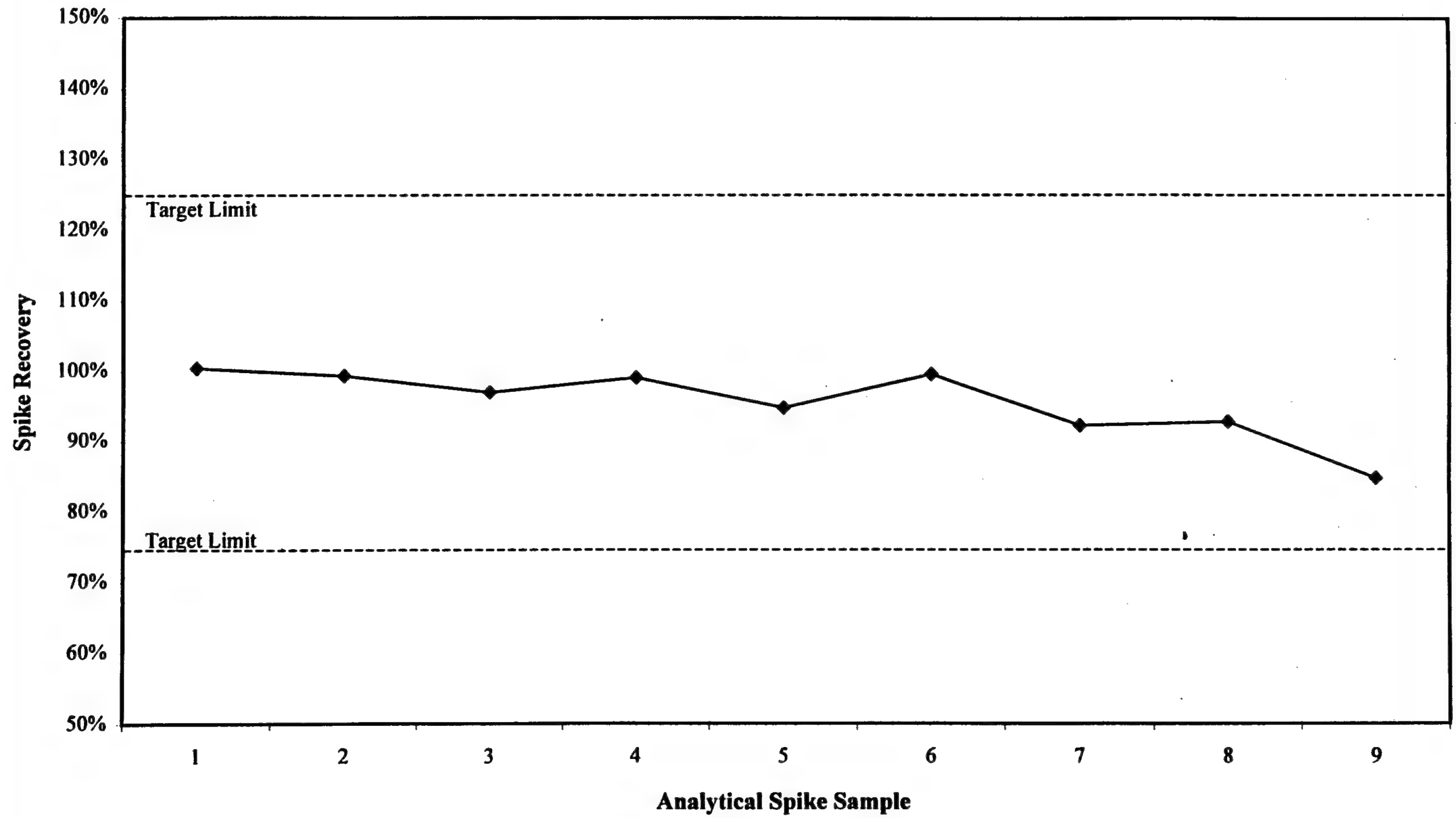
TCLP Analytical Spike Recovery - Vendor 1 (Acetic Acid Process)
Lead



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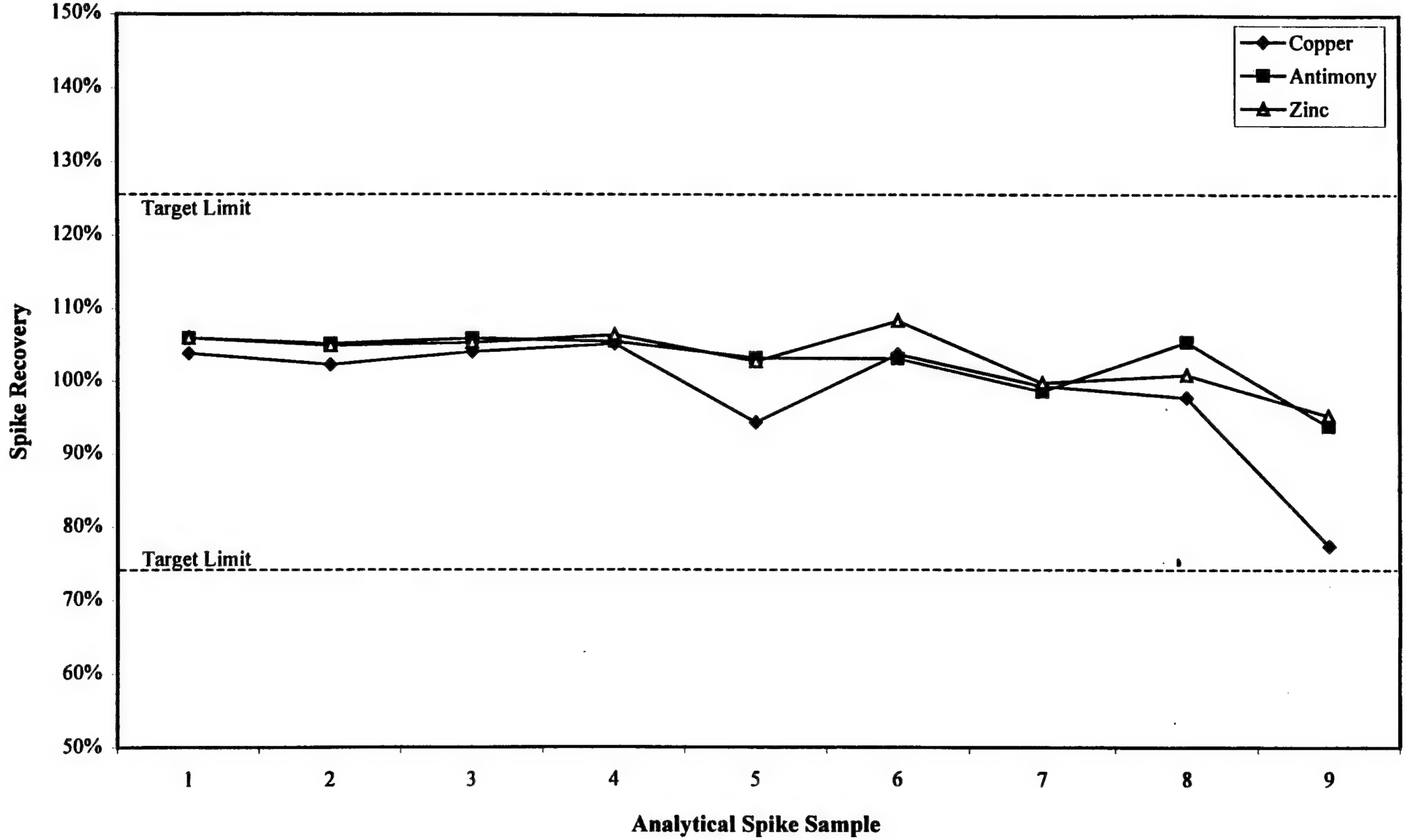
TCLP Analytical Spike Recovery
Copper, Antimony and Zinc



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Total Metals Matrix Spike Recovery - Vendor 1 (Acetic Acid Process)

	Date	Matrix	Copper	Lead	Antimon	Zinc	Comment
1	20-Sep-96	Treated	99%	98%	89%	103%	
2	05-Oct-96	Treated	105%	99%	76%	95%	
3	07-Oct-96	Untreated	146%	164%	115%	138%	
4	14-Oct-96	P	303%	685%	-86%	239%	
5		P	-375%	-1013%	-46%	-251%	
6	10-Oct-96	Treated	109%	98%	83%	111%	
7		Treated	86%	83%	62%	91%	
8	16-Oct-96	Treated	79%	84%	60%	88%	
9		Treated	57%	68%	40%	77%	
10	21-Oct-96	F	93%	76%	75%	100%	
11		F	90%	74%	97%	96%	
12	22-Oct-96	F	61%	122%	-19%	-12%	
13	29-Oct-96	M	84%	115%	99%	84%	
14	05-Nov-96	Untreated	90%	166%	79%	94%	
15		Untreated	91%	122%	81%	96%	
16	07-Nov-96	Untreated	70%	105%	80%	95%	
17	08-Nov-96	Untreated	71%	118%	97%	98%	
18	14-Nov-96	Field Blank	97%	96%	98%	100%	
19		Field Blank	105%	101%	103%	110%	

Battelle

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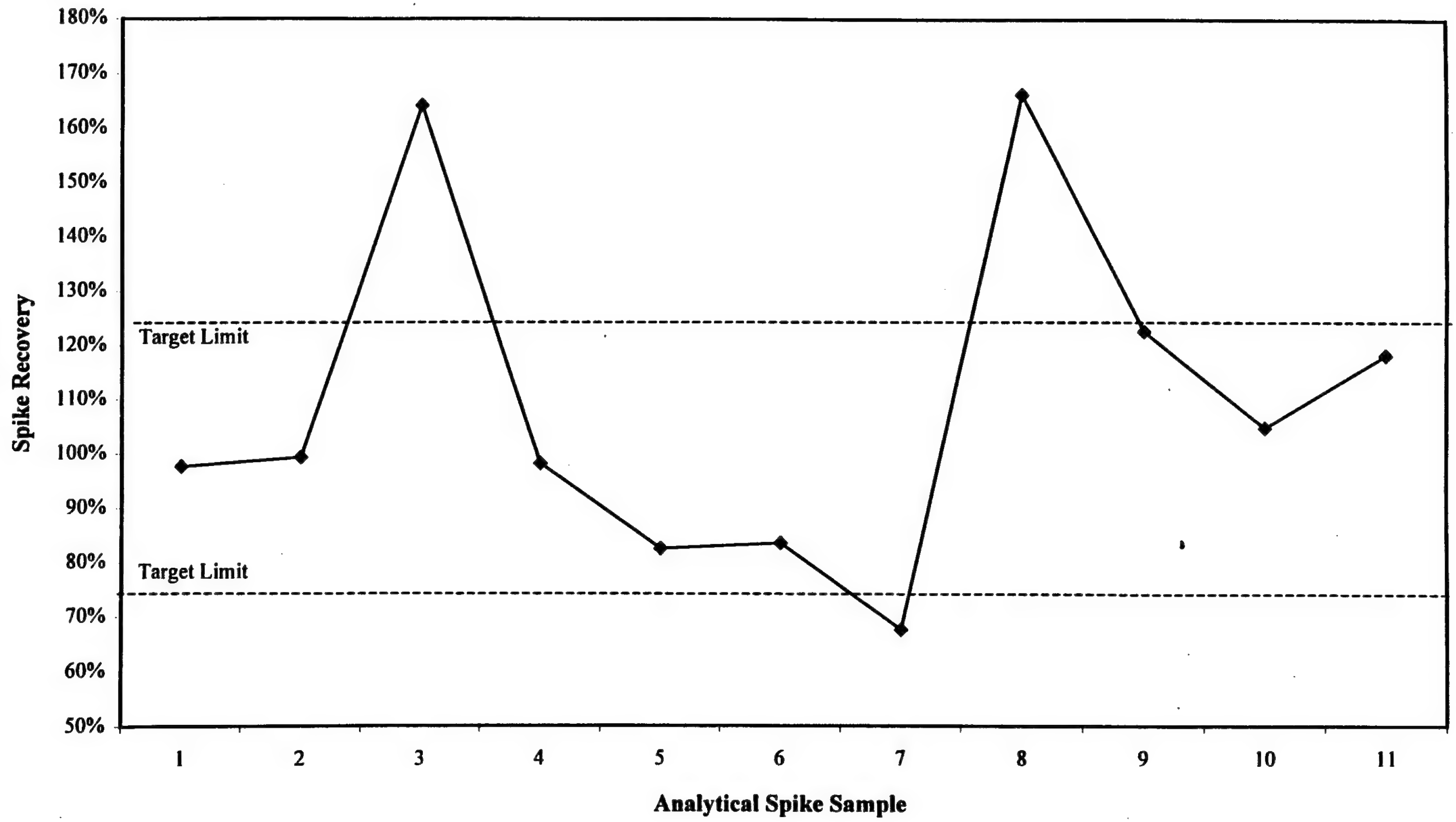
Total Metals Analytical Spike Recovery - Vendor 1 (Acetic Acid Process)

	Date	Matrix	Copper	Lead	Antimon	Zinc	Comment
1	20-Sep-96	Treated	111%	98%	103%	104%	
2	26-Sep-96	Treated	96%	97%	96%	100%	
3	27-Sep-96	L	133%	117%	126%	106%	
4	28-Sep-96	Treated	101%	92%	99%	100%	
5	05-Oct-96	Treated	98%	82%	91%	84%	
6	07-Oct-96	Untreated	91%	88%	82%	90%	
7	14-Oct-96	P	65%	67%	88%	90%	
8	08-Oct-96	Untreated	80%	76%	72%	84%	
9	10-Oct-96	Treated	140%	112%	122%	109%	
10	16-Oct-96	Treated	-21%	60%	88%	84%	
11	22-Oct-96	Treated	114%	103%	96%	102%	
12	05-Nov-96	Untreated	62%	58%	79%	117%	
13	07-Nov-96	Lab Blank	-35%	75%	87%	81%	
14		Field Blank	76%	85%	83%	88%	
15	15-Nov-96	Treated	-9021%	-5%	-986%	48%	
16	18-Nov-96	F	211%	175%	-910%	140%	

Total Metals Matrix Spike Recovery - Vendor 1 (Acetic Acid Process)
Lead



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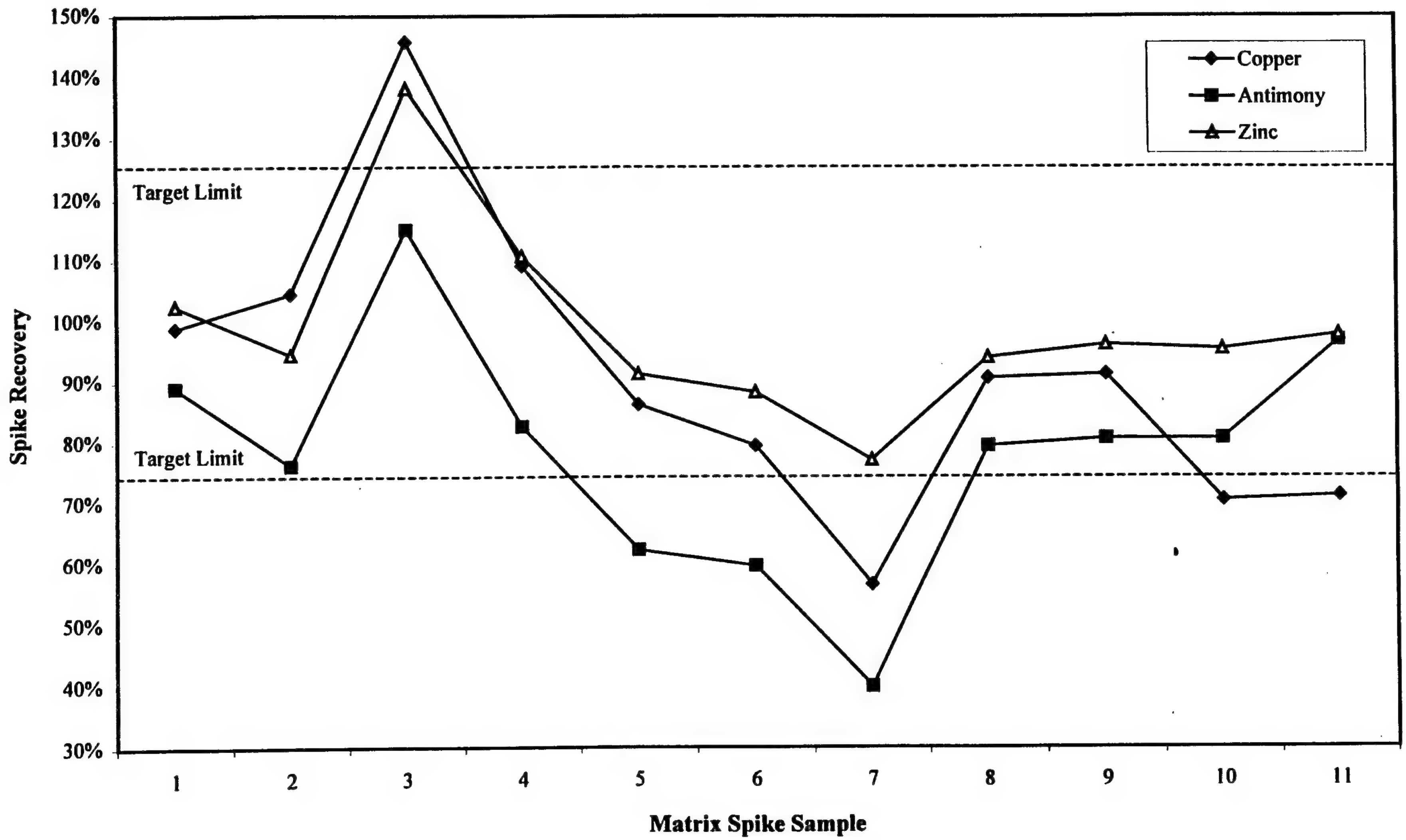
Total Metals Matrix Spike Recovery - Vendor 1 (Acetic Acid Process)
Copper, Antimony and Zinc



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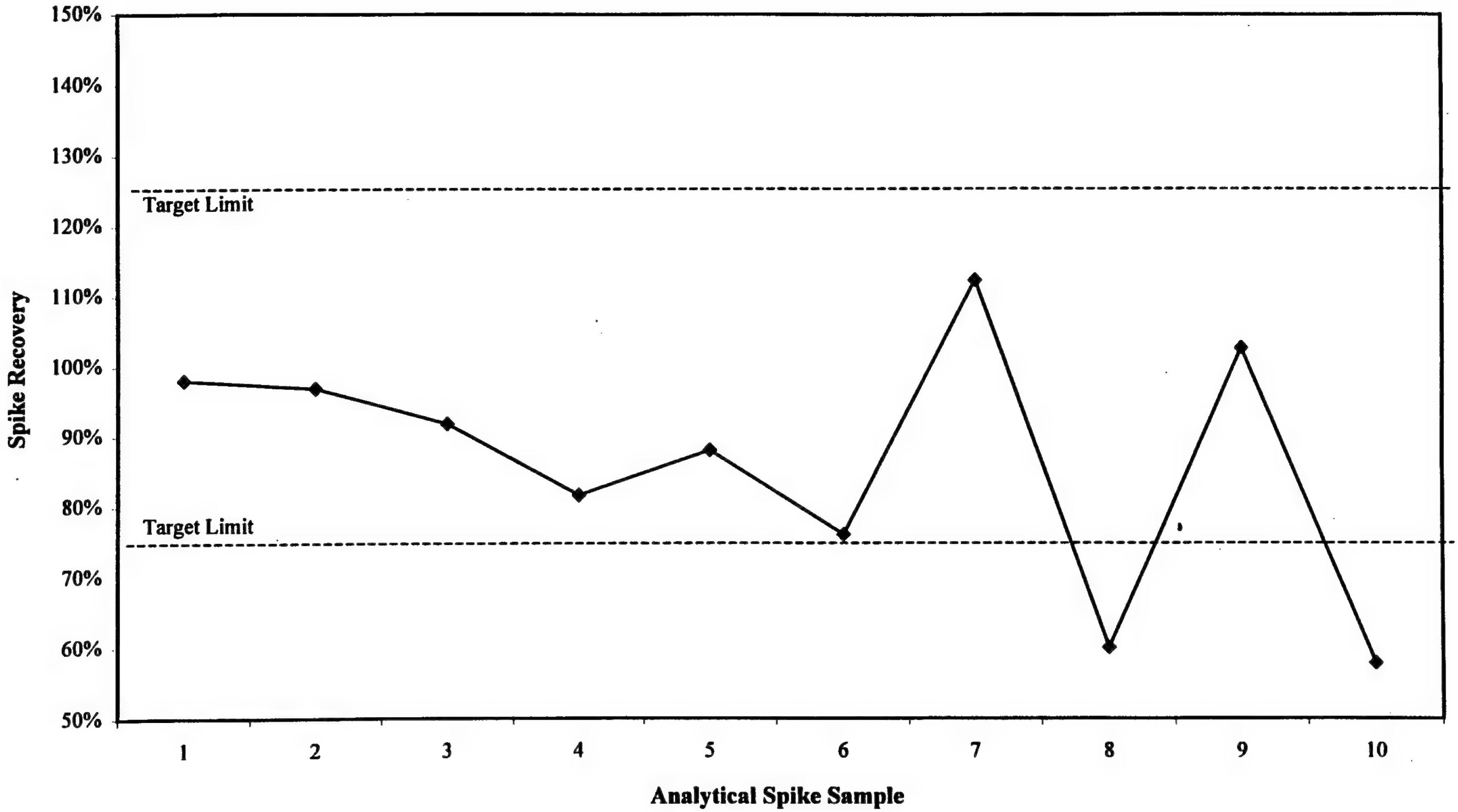
Total Metals Analytical Spike Recovery - Vendor 1 (Acetic Acid Process)
Lead



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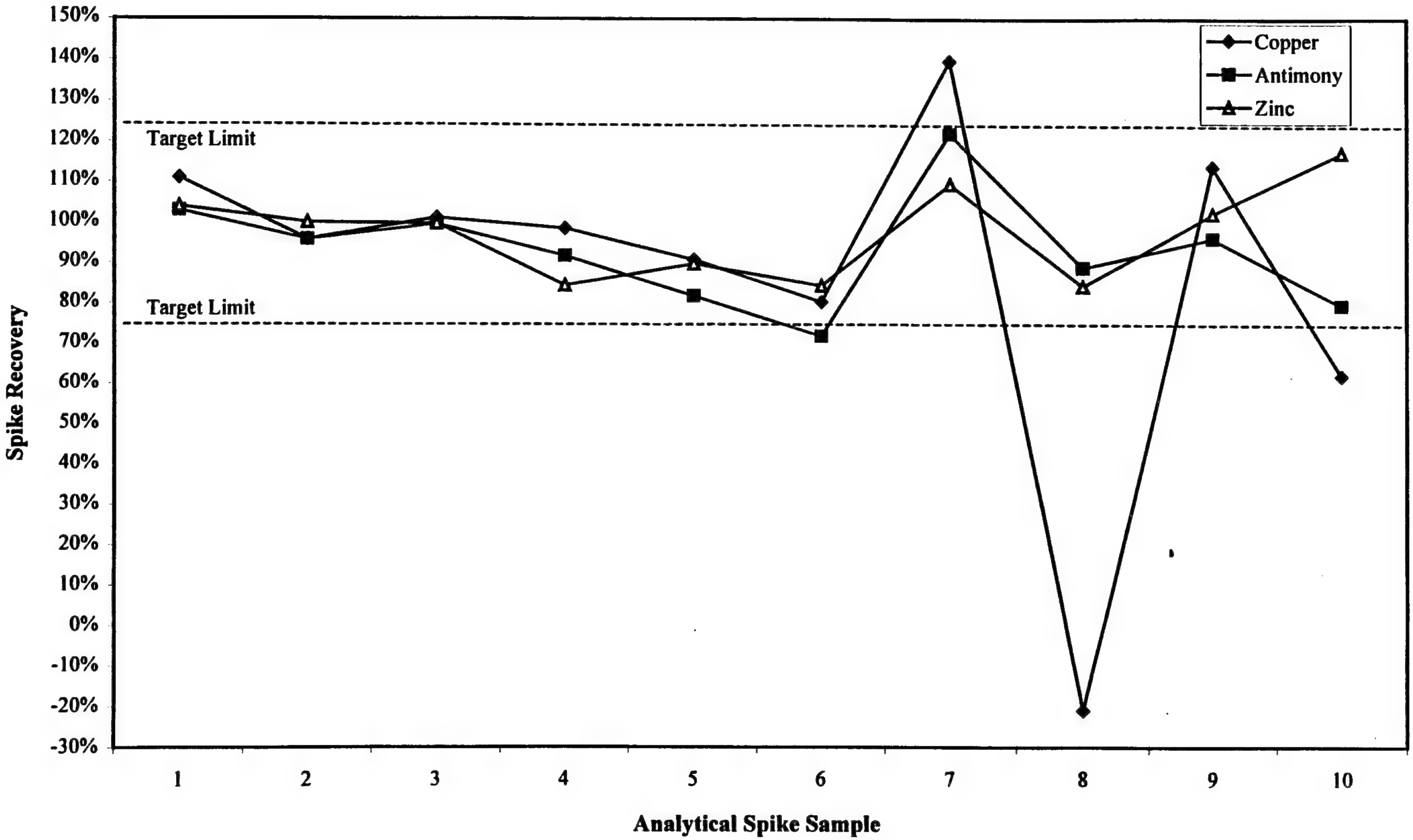
Total Metals Analytical Spike Recovery - Vendor 1 (Acetic Acid Process)
Copper, Antimony and Zinc



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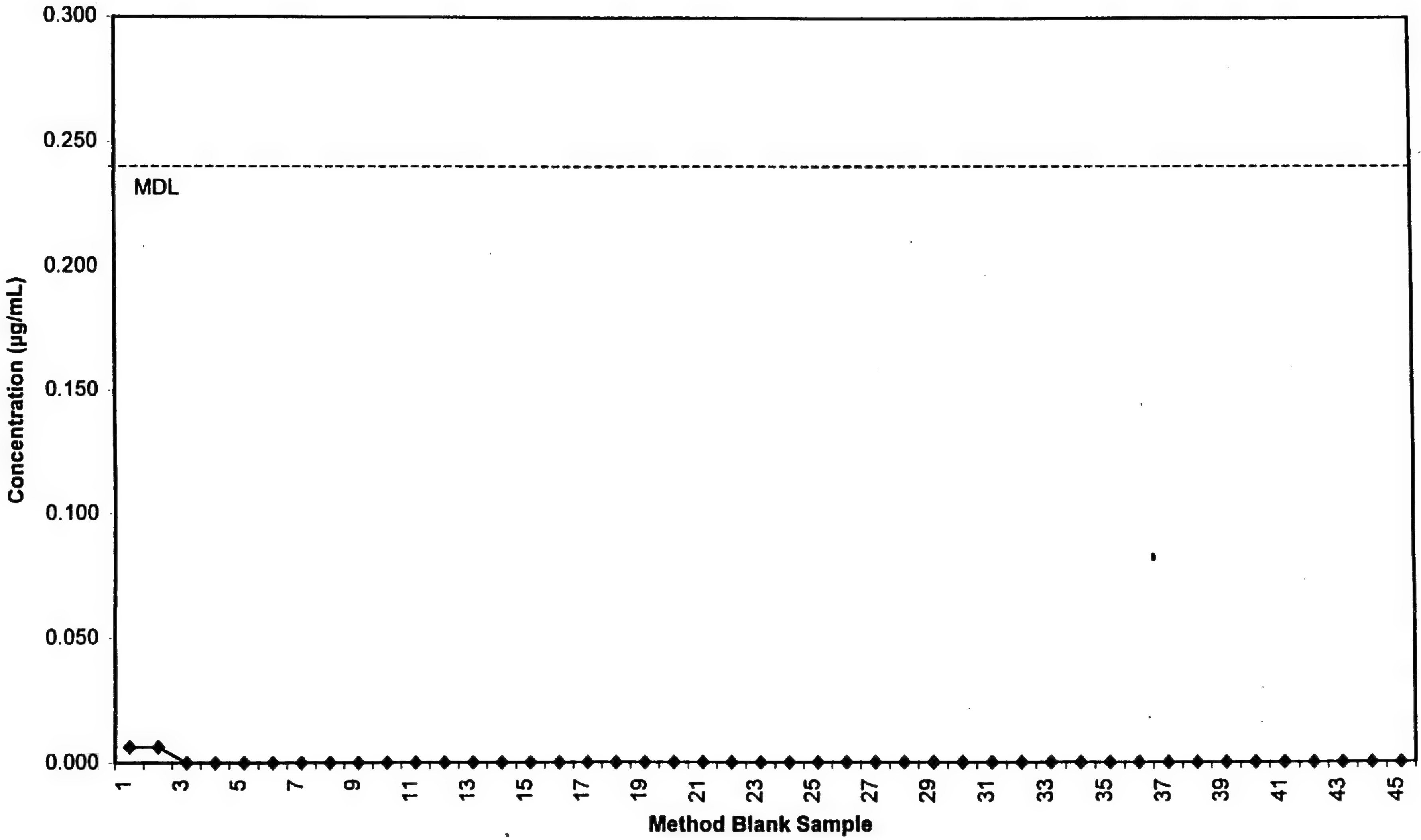
TCLP Method Blanks - Vendor 1 (Acetic Acid Process)

	Date	Copper	Lead	Antimony	Zinc
1	20-Sep-96	0.000	0.006	0.000	0.017
2		0.000	0.006	0.011	0.000
3		0.000	0.000	0.006	0.00
4		0.000	0.000	0.012	0.000
5	26-Sep-96	0.000	0.000	0.002	0.000
6		0.000	0.000	0.000	0.000
7		0.000	0.000	0.004	0.000
8	27-Sep-96	0.000	0.000	0.000	0.000
9		0.000	0.000	0.000	0.000
10		0.000	0.000	0.000	0.000
11	28-Sep-96	0.000	0.000	0.000	0.000
12		0.000	0.000	0.000	0.000
13		0.000	0.000	0.000	0.000
14	05-Oct-96	0.000	0.000	0.000	0.000
15		0.000	0.000	0.000	0.000
16		0.000	0.000	0.000	0.000
17	07-Oct-96	0.000	0.000	0.001	0.000
18		0.000	0.000	0.002	0.000
19		0.000	0.000	0.000	0.000
20	14-Oct-96	0.000	0.000	0.000	0.000
21		0.000	0.000	0.005	0.000
22		0.000	0.000	0.013	0.000
23	08-Oct-96	0.000	0.000	0.000	0.000
24		0.000	0.000	0.000	0.000
25		0.000	0.000	0.000	0.000
26	10-Oct-96	0.000	0.000	0.000	0.000
27		0.000	0.000	0.000	0.000
28		0.000	0.000	0.000	0.000
29	16-Oct-96	0.000	0.000	0.000	0.000
30		0.000	0.000	0.000	0.000
31	21-Oct-96	0.000	0.000	0.000	0.000
32		0.000	0.000	0.004	0.000
33		0.000	0.000	0.003	0.000
34	22-Oct-96	0.000	0.000	0.000	0.000
35		0.000	0.000	0.000	0.000
36		0.000	0.000	0.000	0.000
37	29-Oct-96	0.000	0.000	0.000	0.000
38		0.000	0.000	0.000	0.000
39		0.000	0.000	0.000	0.000
40	05-Nov-96	0.000	0.000	0.000	0.000
41		0.000	0.000	0.000	0.000
42		0.000	0.000	0.000	0.000
43	07-Nov-96	0.000	0.000	0.000	0.006
44		0.000	0.000	0.000	0.014
45		0.000	0.000	0.000	0.008
	Average	0.000	0.000	0.001	0.001
	Std. Dev.	0.00	0.00	0.00	0.00

TCLP Method Blank - Vendor 1 (Acetic Acid Process)
Lead



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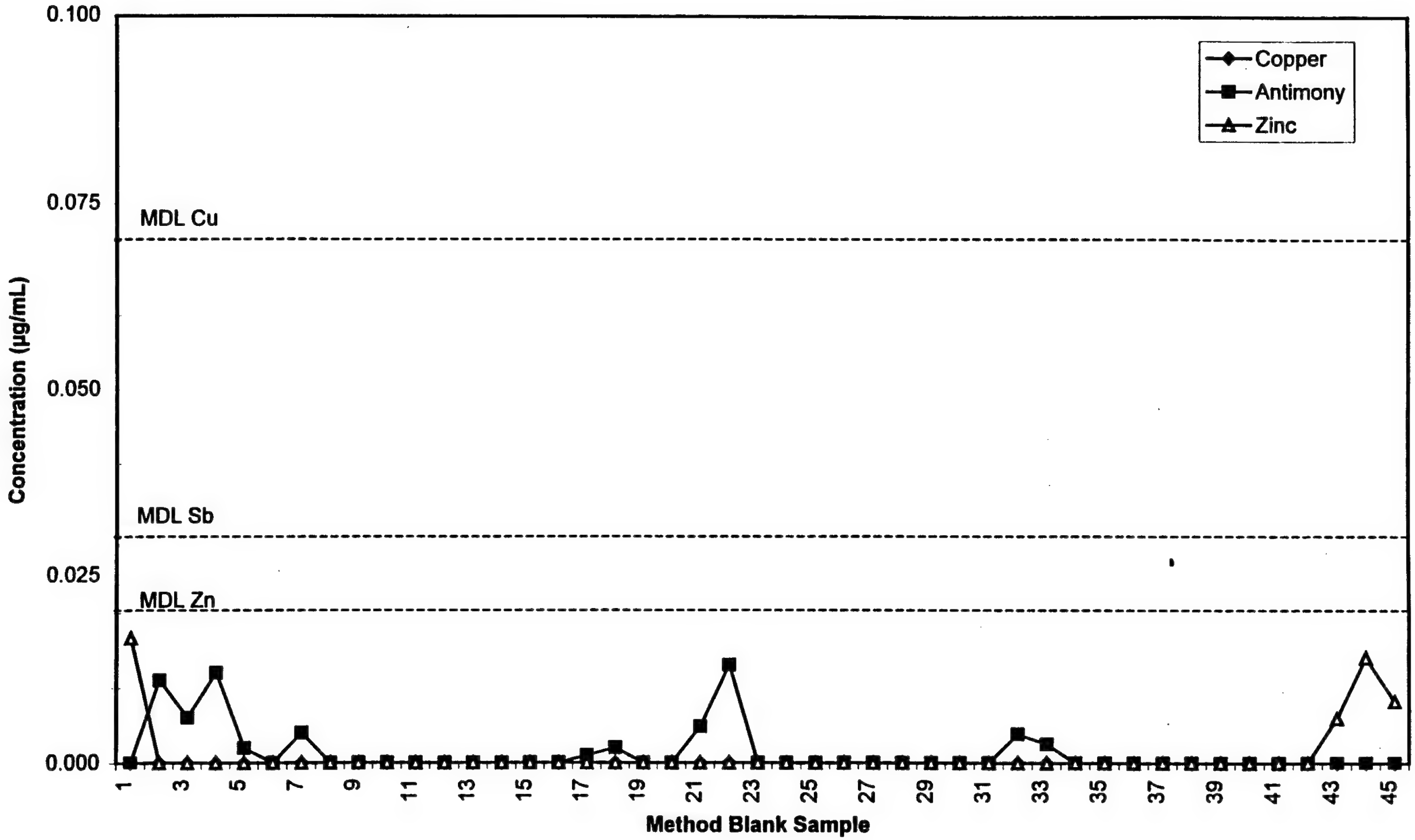
TCLP Method Blank - Vendor 1 (Acetic Acid Process)
Copper, antimony and Zinc



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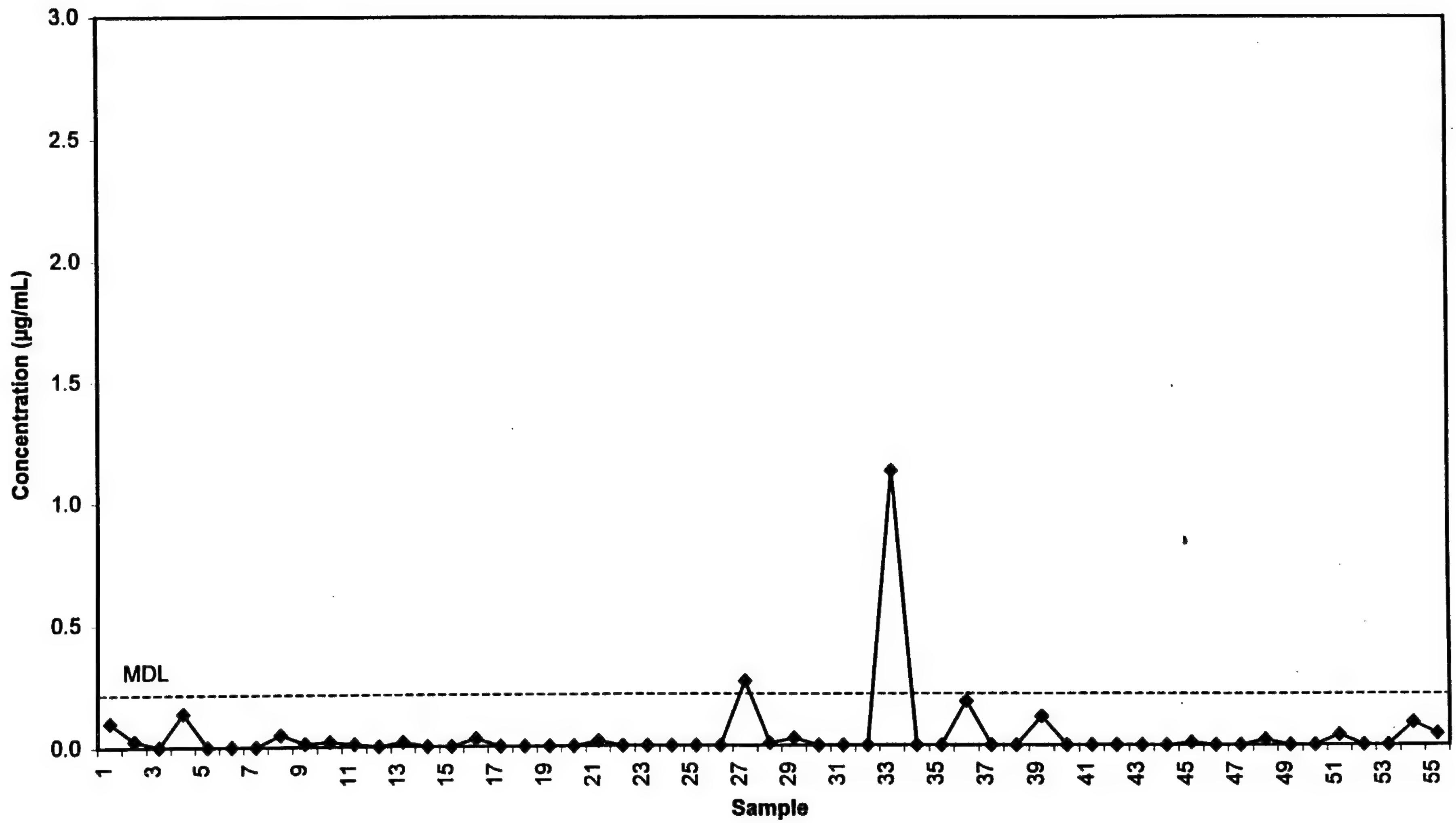
Total Metals Method Blanks - Vendor 1 (Acetic Acid Process)

	Date	Copper	Lead	Antimony	Zinc
1	20-Sep-96	0.059	0.099	0.016	0.010
2		0.022	0.026	0.000	0.001
3		0.000	0.000	0.000	0.000
4	26-Sep-96	0.036	0.136	0.014	0.000
5		0.000	0.000	0.020	0.000
6		0.000	0.000	0.005	0.000
7		0.000	0.000	0.008	0.000
8	27-Sep-96	0.048	0.049	0.000	0.010
9		0.027	0.013	0.000	0.010
10		0.001	0.019	0.000	0.000
11	28-Sep-96	0.066	0.009	0.000	0.012
12		0.018	0.000	0.003	0.000
13	05-Oct-96	0.022	0.019	0.000	0.019
14		0.000	0.000	0.000	0.006
15		0.000	0.000	0.000	0.003
16	07-Oct-96	0.031	0.031	0.000	0.017
17		0.022	0.000	0.000	0.018
18		0.004	0.000	0.000	0.007
19	14-Oct-96	0.000	0.000	0.012	0.018
20		0.000	0.000	0.013	0.003
21	08-Oct-96	0.019	0.020	0.003	0.016
22		0.000	0.000	0.000	0.005
23		0.000	0.000	0.000	0.003
24	10-Oct-96	0.029	0.000	0.000	0.000
25		0.002	0.000	0.000	0.000
26		0.003	0.000	0.000	0.000
27	16-Oct-96	0.038	0.263	0.000	0.023
28		0.005	0.010	0.000	0.023
29		0.000	0.029	0.063	0.010
30	21-Oct-96	0.001	0.000	0.006	0.000
31		0.000	0.000	0.000	0.000
32		0.000	0.000	0.000	0.000
33	22-Oct-96	0.222	1.13	0.000	0.017
34		0.030	0.000	0.000	0.014
35		0.000	0.000	0.000	0.011
36	29-Oct-96	0.095	0.179	0.000	0.005
37		0.019	0.000	0.000	0.000
38		0.000	0.000	0.000	0.000
39	05-Nov-96	0.100	0.116	0.000	0.015
40		0.029	0.000	0.000	0.011
41		0.004	0.000	0.000	0.006
42	07-Nov-96	0.077	0.000	0.000	0.034
43		0.031	0.000	0.000	0.027
44		0.024	0.000	0.000	0.029
45	14-Nov-96	0.036	0.011	0.000	0.019
46		0.015	0.000	0.000	0.017
47		0.002	0.000	0.000	0.014

Total Metals Method Blanks - Vendor 1 (Acetic Acid Process)

48	15-Nov-96	0.036	0.021	0.008	0.011
49		0.017	0.000	0.000	0.010
50		0.009	0.000	0.000	0.007
51	18-Nov-96	0.073	0.040	0.000	0.022
52		0.049	0.000	0.000	0.022
53		0.012	0.000	0.000	0.015
54		0.775	0.091	0.005	0.061
55		0.564	0.046	0.000	0.000
	Average	0.049	0.043	0.003	0.011
	Std. Dev.	0.129	0.157	0.009	0.011

Total Metals Method Blank - Vendor 1 (Acetic Acid Process)
Lead



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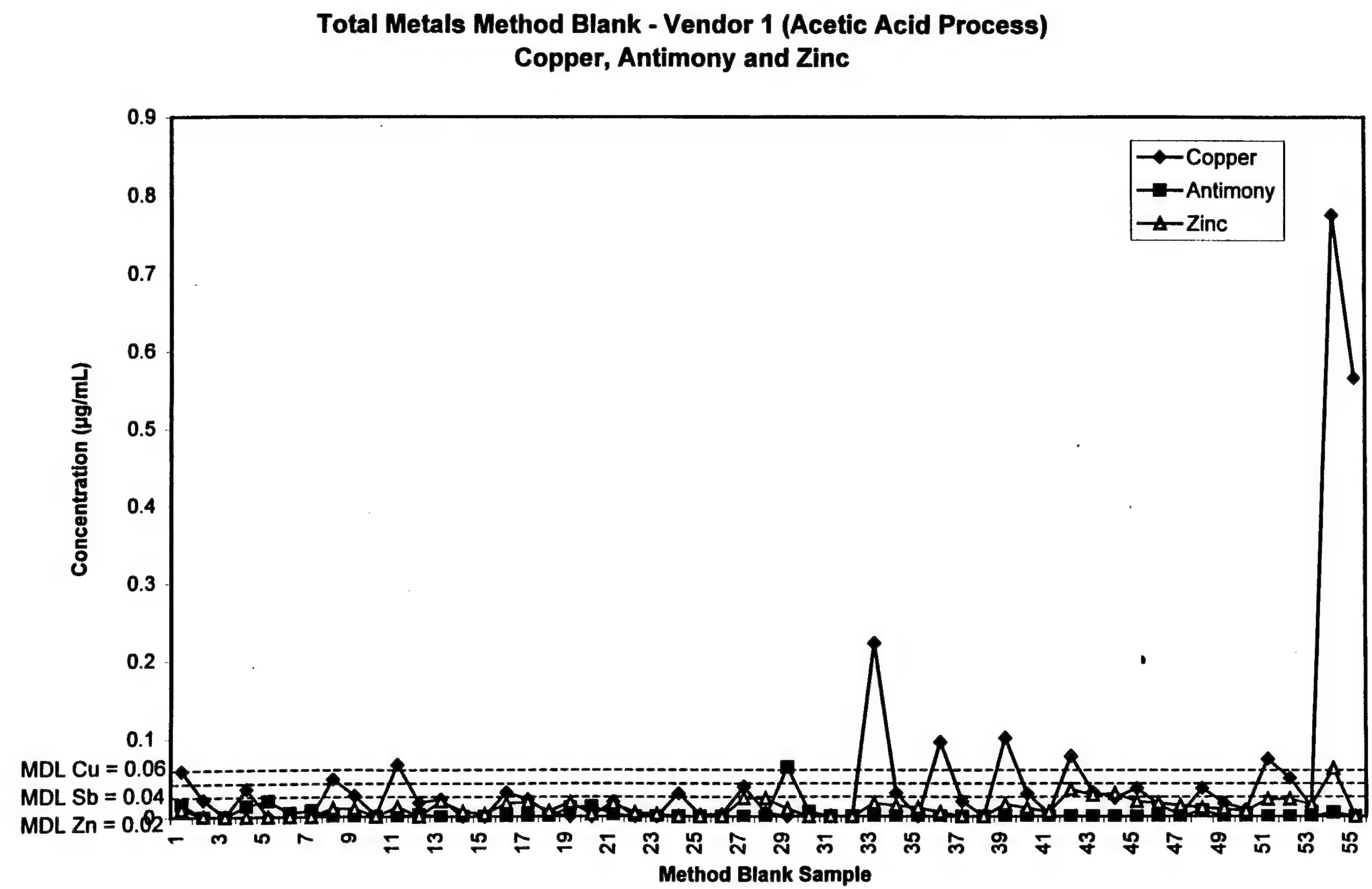

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Appendix G
Vendor 2 (Hydrochloric Acid) Data

Table G-1. Vendor 2 (Hydrochloric Acid Process) Data Summary

Sample No.	Process Stream	Analysis Type	Units	Results			
				Cu	Pb	Sb	Zn
B-NV14-FB	field blank	TCLP METALS	μg/mL μg/g	0.000	0.000	0.008	0.288
B-NV15-Z	organic matter	TCLP METALS	μg/mL μg/g	1.94 4005	11.1 6457	0.064 32.9	1.15 1672
B-NV15-T	processed soil	TCLP METALS	μg/mL μg/g	0.768 50.0	3.07 143	0.14 56.1	1.07 17.6
B-NV16-T	processed soil	TCLP METALS	μg/mL μg/g	0.164 48.6	1.83 178	0.369 64.5	0.166 14.3
B-NV16-U	raw soil	TCLP METALS	μg/mL μg/g	1.12 2302	18.4 4819	0.154 255	0.348 182
B-NV20-T	processed soil	TCLP METALS	μg/mL μg/g	0.080 54	0.958 125	0.340 54	0.087 17
B-NV20-U	raw soil	TCLP METALS	μg/mL μg/g	1.10 1958	20.7 4152	0.098 216	0.330 158
B-NV21-T	processed soil	TCLP METALS	μg/mL μg/g	0.155 60.3	1.32 134	0.485 80.3	0.435 18.5
B-NV21-U	raw soil	TCLP METALS	μg/mL μg/g	1.16 1659	37.3 3567	0.188 190	0.389 136.1
B-NV22-T	processed soil	TCLP METALS	μg/mL μg/g	0.022 63	0.56 115	0.677 89.0	0.145 21.2
B-NV22-U	raw soil	TCLP METALS	μg/mL μg/g	0.913 1975	33.5 4068	0.179 205.6	0.367 156.5
B-NV22-C	coarse processed fraction	TCLP METALS	μg/mL μg/g	0.272 111	4.41 135	0.011 29.1	0.118 14.8
B-NV22-M	jig concentrate	TCLP METALS	μg/mL μg/g	1.13 99	36.6 1644	1.56 208	0.434 15.8
B-NV22-K	feed to jig	TCLP METALS	μg/mL μg/g	1.01 277	13.9 360	0.253 47.8	0.189 34.5
B-NV23-T	processed soil	TCLP METALS	μg/mL μg/g	0.005 70.7	1.75 232	0.575 105	0.402 19.6
B-NV25-T	processed soil	TCLP METALS	μg/mL μg/g	0.000 81	2.15 235	1.11 115	0.059 23
B-NV25-P	precipitate sludge	TCLP METALS	μg/mL μg/g	48.5 4262	1474 16455	0.066 309	10.7 689
B-NV25-U	raw soil	TCLP METALS	μg/mL μg/g	0.790 2456	31.9 5194	0.080 262	0.246 193
B-NV26-T	processed soil	TCLP METALS	μg/mL μg/g	0.00 51.5	1.97 181	0.483 73.6	0.131 14.8
B-NV26-U	raw soil	TCLP METALS	μg/mL μg/g	0.854 2461	36.3 5040	0.405 248	0.379 190
B-NV26-Qf	spent leachant	METALS	μg/mL	7.52	103	0.434	2.33
B-NV26-Qc	regenerated leachant	METALS	μg/mL	0.656	7.66	0.029	0.105
B-NV27-T	processed soil	TCLP METALS	μg/mL μg/g	0.197 63.1	2.84 165	0.137 77.8	0.192 16.4
B-NV29-T	processed soil	TCLP METALS	μg/mL μg/g	0.455 85.3	3.44 230	0.212 127.8	0.227 21.9
B-NV30-T	processed soil	TCLP METALS	μg/mL μg/g	0.367 62.5	3.53 233	0.041 93.5	0.220 14.8

Table G-1. Vendor 2 (Hydrochloric Acid Process) Data Summary

Sample No.	Process Stream	Analysis Type	Units	Results Cu	Pb	Sb	Zn
		METALS	µg/g	82.5	175	94.3	23.4
B-DC03-FB	field blank	TCLP	µg/mL	0.000	0.000	0.000	0.031
		METALS	µg/g	6.19	6.58	1.09	6.25
B-DC03-T	processed soil	TCLP	µg/mL	0.095	1.36	0.306	0.091
		METALS	µg/g	48.1	132	68.6	14.1
B-DC03-U	raw soil	TCLP	µg/mL	0.676	40.4	0.906	0.359
		METALS	µg/g	1612	3351	172	127
B-DC04-T	processed soil	TCLP	µg/mL	0.330	2.35	0.147	0.156
		METALS	µg/g	54.2	113	65.0	15.2
B-DC04-U	raw soil	TCLP	µg/mL	2.02	13.7	0.157	0.275
		METALS	µg/g	1329	2743	149	111
B-DC05-T	processed soil	TCLP	µg/mL	0.118	3.06	0.256	0.161
		METALS	µg/g	58	127	77.4	16.2
B-DC05-C	coarse processed fraction	TCLP	µg/mL	1.42	44.2	0.042	0.441
		METALS	µg/g	114	214	32.3	13.4
B-DC05-Z	organic matter	TCLP	µg/mL	2.99	7.84	0.103	0.944
		METALS	µg/g	2084	10896	44.2	190
B-DC05-K	feed to jig	TCLP	µg/mL	2.18	64.5	1.16	0.292
		METALS	µg/g	418	1249	111	53
B-DC06-T	processed soil	TCLP	µg/mL	0.061	0.757	0.551	0.119
		METALS	µg/g	50	123	89	17
B-DC06-Qf-1A	spent leachant	METALS	µg/mL	7.36	88.2	0.347	1.36
B-DC06-Qc-1A	regenerated leachant	METALS	µg/mL	1.15	15.3	0.024	0.411
B-DC06-L	leach circuit feed	TCLP	µg/mL	1.24	11.9	0.240	0.656
		METALS	µg/g	106	405	150	29.2
B-DC06-P	precipitate sludge	TCLP	µg/mL	59.5	2235	0.000	16.6
		METALS	µg/g	8828	21571	478	1462
B-DC06-F	fine processed fraction	TCLP	µg/mL	0.203	1.95	0.220	0.138
		METALS	µg/g	88.5	150	105	20.7
B-DC12-T	processed soil	TCLP	µg/mL	0.166	2.67	0.662	0.145
		METALS	µg/g	121	671	79.2	26.1
B-WZ-A1	sample preparation area soil	TCLP	µg/mL	0.000	0.000	0.007	0.235
		METALS	µg/g	11.0	8.54	1.26	107
B-WZ-A2	sample preparation area soil	TCLP	µg/mL	0.000	0.001	0.000	1.191
		METALS	µg/g	17.1	37.3	1.01	134
B-WZ-A3	sample preparation area soil	TCLP	µg/mL	0.000	0.000	0.000	0.224
		METALS	µg/g	25.0	18.1	0.689	111

Table G-2. Total Metals Overall Result Calculations for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
B-NV14-FB-1A		0.0	-200		8.95	0.823	0.273	7.57
			+30		2.12	1.76	0	10.4
B-NV15-T-1D	2.97	9.1	-200	1223	51.1	163	56.3	17.8
			+30	1.7	0.000	22.4	2.80	5.48
WEIGHTED AVG.					51.0	163	56.2	17.8
B-NV15-T-1E	2.70	9.3	-200	1110	49.0	124	56.1	17.5
			+30	1.0	0.000	53.3	8.46	9.29
WEIGHTED AVG.					49.0	124	56.0	17.5
OVERALL RESULT					**50.0**	**143**	**56.1**	**17.6**
B-NV16-T-1D	3.16	0.0	-200	1425	48.1	174	65.1	14.4
			+30	8.3	411	924	139	48.2
WEIGHTED AVG.					50.2	179	65.6	14.6
B-NV16-T-1E	3.44	0.0	-200	1549	45.7	165	63.9	14.0
			+30	10.9	224	2000	2.70	15.5
WEIGHTED AVG.					47.0	178	63.4	14.0
OVERALL RESULT					**48.6**	**178**	**64.5**	**14.3**
B-NV16-U-1D	1.2	1.84	-200	529	112	783	80.2	28.6
			+30	5.80	11210	26155	1561	1119
WEIGHTED AVG.					232.47	1058.4	96.27	40.44
B-NV16-U-1E	3.464	3.37	-200	1508	120	763	79.4	28.8
			+30	10.70	6000	13930	705	583
WEIGHTED AVG.					161.44	855.8	83.81	32.71
			+10	491.30	267800	491900	21000	18500
AVG.	150	8.2	-10	61962	196.95	957.11	90.04	36.57
OVERALL RESULT					**2302**	**4819**	**255**	**182**
B-NV20-T-1D	2.892	2.14	-200	1270	54.1	129	55.9	17.2
			+30	13.3	308	138	4.20	67.2
WEIGHTED AVG.					56.7	129	55.4	17.7
B-NV20-T-1E	2.99	2.01	-200	1321	51.0	122	52.9	16.2
			+30	8.2	131	76	7.95	27.1
WEIGHTED AVG.					51.5	122	52.6	16.3
OVERALL RESULT					**54.1**	**125**	**54.0**	**17.0**
B-NV20-U-1D	3.356	0.89	-200	1495	100	759	65.9	26.3
			+30	14.20	6856	17458	895	633
WEIGHTED AVG.					163.59	916.2	73.70	32.01
B-NV20-U-1E	3.352	3.334	-200	1456	112	738	71.4	28.8
			+30	13.40	8491	13126	902	1017
WEIGHTED AVG.					188.39	850.9	78.97	37.81
			+10	617.70	267800	491900	21000	18500
AVG.	225	9.1	-10	92171.5	175.99	883.56	76.34	34.91
OVERALL RESULT					**1958**	**4152**	**216**	**158**
B-NV21-T-1D	2.862	0.00	-200	1294	62.8	138	81.1	18.4
			+30	3.9	770.0	71	9.1	163.7
WEIGHTED AVG.					64.9	138	80.9	18.8
B-NV21-T-1E	2.83	0.00	-200	1277	55.3	130	80.0	17.9
			+30	6.4	140.0	88.1	9.52	63.5
WEIGHTED AVG.					55.7	130	79.6	18.1
OVERALL RESULT					**60.3**	**134**	**80.3**	**18.5**

Table G-2. Total Metals Overall Result Calculations for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
B-NV21-U-1D	3.646	0.00	-200	1647	89.7	691	66.3	27.4
			+30	6.5	1647	14966	1029	178
WEIGHTED AVG.					95.82	747.1	70.08	27.99
B-NV21-U-1E	3.396	0.00	-200	1524	92.5	602	62.7	28.0
			+30	16.0	1501	7163	414.00	149.0
WEIGHTED AVG.					107.13	670.1	66.35	29.26
			+10	357.9	267800	491900	21000	18500
AVG.	150	9.6	-10	61145.28	101.48	708.63	68.22	28.62
OVERALL RESULT					1659	3567	190.0	136.1
B-NV22-T-1D	3.018	0.00	-200	1366	63.2	114	91.6	21.1
			+30	3.2	47.0	51.7	13.2	28.1
WEIGHTED AVG.					63.2	114	91.4	21.1
B-NV22-T-1E	2.986	0.00	-200	1348	62.6	114	86.8	21.3
			+30	6.7	61	368	24.70	18.6
WEIGHTED AVG.					62.6	115	86.5	21.3
OVERALL RESULT					62.9	115	89.0	21.2
B-NV22-U-1D	2.904	3.93	-200	1255	85.5	604	59.5	23.7
			+30	10.2	7655	15491	695	731
WEIGHTED AVG.					146.51	724.0	64.62	29.40
B-NV22-U-1E	2.856	2.75	-200	1250	90.3	596	56.4	26.3
			+30	10.1	4668	9025	372	473
WEIGHTED AVG.					127.00	663.6	58.93	29.88
			+10	426.7	267800	491900	21000	18500
AVG.	150	8.7	-10	61690	136.75	693.78	61.78	29.64
OVERALL RESULT					1975	4068	205.6	156.5
B-NV22-K-1A	2.916	0.412	-200	1295	36.8	304	44.8	7.24
			+30	22.6	177	1636	149.0	32.4
WEIGHTED AVG.					39.2	327	46.6	7.7
B-NV22-K-1B	3.2	0.625	-200	1431	40.3	315.0	47.9	7.78
			+30	11.00	62229	10457	191	7038
WEIGHTED AVG.					514.5	392	49.0	61.4
OVERALL RESULT					277	360	47.8	34.5
B-NV22-C-1A	3.504	0.00	-200	1567	17.3	129	28.0	4.35
			+30	22	160.0	219	3.13	28.2
WEIGHTED AVG.					19.3	130	27.7	4.7
B-NV22-C-1B	3.64	0.00	-200	1621	17.2	133	30.2	4.49
			+30	30.60	9999.0	495	44.8	1108.0
WEIGHTED AVG.					202.2	140	30.5	24.9
OVERALL RESULT					111	135	29.1	14.8
B-NV22-M-1A	3.138	0.319	-200	1380.56	93.8	1663	212	15.3
			+30	38.30	291.0	961	79.6	34.3
OVERALL RESULT					99.1	1644	208	15.8
B-NV23-T-1D	2.76	3.7	-200	1198	68.6	221	105.0	19.4
			+30	7.80	771.0	1005	33.9	103.0
WEIGHTED AVG.					73.1	226	104.5	19.9
B-NV23-T-1E	2.86	3.7	-200	1238	67.1	231	107.0	19.1
			+30	11.50	193	973	31.4	30.1
WEIGHTED AVG.					68.3	238	106.3	19.2
OVERALL RESULT					70.7	232	105.4	19.6

Table G-2. Total Metals Overall Result Calculations for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
B-NV25-T-1D	3.25	0.00	-200	1462	76.7	239	117	23.1
			+30	12.10	846	421	21.3	107
WEIGHTED AVG.					83.0	240	116.2	23.8
B-NV25-T-1E	3.234	0.00	-200	1455	74.5	229	115	21.6
			+30	12.10	663	202	20.1	128
WEIGHTED AVG.					79.4	229	114.2	22.5
OVERALL RESULT					**81.2**	**235**	**115.2**	**23.1**
B-NV25-U-1D	3.442	0.00	-200	1538	134.0	895	82.2	30.7
			+30	23.6	6545	14436	649	643
WEIGHTED AVG.					230.91	1099.7	90.77	39.96
B-NV25-U-1E	3.37	0.00	-200	1514	138.0	868	76.8	31.1
			+30	15.0	4340	17685	579.00	426.0
WEIGHTED AVG.					179.23	1033.0	81.73	34.98
			+10	465.5	267800	491900	21000	18500
AVG.	136	10.3	-10	54885.6	205.07	1066.35	86.25	37.47
OVERALL RESULT					**2456**	**5194**	**262.1**	**192.7**
B-NV25-P-1A	1.208	0.00	-200	547	4260.0	16343	309.0	689.0
			+30	0.90	5702	84272	331.0	752.0
OVERALL RESULT					**4262**	**16455**	**309**	**689**
B-NV26-T-1D	3.386	0.00	-200	1521	50.7	180	73.5	15.1
			+30	14.80	82.6	176	16.0	17.8
WEIGHTED AVG.					51.0	180	72.9	15.1
B-NV26-T-1E	3.38	0.00	-200	1529	51.4	179	74.4	14.4
			+30	4.60	218.0	1118	36.3	35.3
WEIGHTED AVG.					51.9	182	74.3	14.5
OVERALL RESULT					**51.5**	**181**	**73.6**	**14.8**
B-NV26-U-1D	3.432	0.00	-200	1552	102.0	698	63.0	26.4
			+30	4.6	11421	39096	1610	1108
WEIGHTED AVG.					135.45	811.5	67.57	29.60
B-NV26-U-1E	3.4	0.00	-200	1539	137.0	750	63.2	29.1
			+30	3.7	11148	16659	1417	804.00
WEIGHTED AVG.					163.42	788.2	66.45	30.96
			+10	483.6	267800	491900	21000	18500
AVG.	136	9.2	-10	55520.64	149.43	799.81	67.01	30.28
OVERALL RESULT					**2461**	**5040**	**247.8**	**189.8**
B-NV27-T-1D	3.512	0.00	-200	1584	60.2	154	76.6	16.5
			+30	8.60	934	2219	90.1	104.0
WEIGHTED AVG.					64.9	165	76.7	17.0
B-NV27-T-1E	3.51	0.00	-200	1585	58.3	160	78.7	15.5
			+30	6.80	777.0	1360	142.0	86.7
WEIGHTED AVG.					61.4	165	79.0	15.8
OVERALL RESULT					**63.1**	**165**	**77.8**	**16.4**
B-NV29-T-1D	3.324	0.00	-200	1492	76.8	215	126.0	20.9
			+30	15.90	1186	1927	44.0	130.0
WEIGHTED AVG.					88.5	233	125.1	22.1
B-NV29-T-1E	3.482	0.00	-200	1564	77.8	222	131.0	21.4
			+30	15.70	509.0	750	85.2	64.1
WEIGHTED AVG.					82.1	227	130.5	21.8
OVERALL RESULT					**85.3**	**230**	**127.8**	**21.9**

Table G-2. Total Metals Overall Result Calculations for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
B-NV30-T-1D	3.324	0.00	-200	1501	59.3	227	95.6	14.6
			+30	6.80	1006	1481	129	118.0
WEIGHTED AVG.					63.6	233	95.8	15.1
B-NV30-T-1E	3.296	0.00	-200	1480	58.4	218	91.1	14.3
			+30	15.00	365	1669	98.0	47.0
WEIGHTED AVG.					61.5	233	91.2	14.6
OVERALL RESULT					62.5	233	93.5	14.8
B-DC02-T-1D	2.902	1.38	-200	1291	47.5	163	64.2	12.7
			+30	7.50	672	774	81.7	72.4
WEIGHTED AVG.					51.1	167	64.3	13.0
B-DC02-T-1E	2.918	3.15	-200	1273	49.8	174	66.5	13.3
			+30	8.70	897	2255	101	94.1
WEIGHTED AVG.					55.5	188	66.7	13.8
OVERALL RESULT					53.3	177	65.5	13.4
B-DC02-F-1A	3.128	0.00	-200	1417	82.5	175	94.4	23.4
			+30	1.70	94.8	530	48.9	32.3
OVERALL RESULT					82.5	175	94.3	23.4
B-DC02-L-1A	2.976	0.00	-200	1343	99.7	428	155	27.2
			+30	7.30	125	350	181	41.1
OVERALL RESULT					99.8	428	155	27.3
B-DC03-T-1D	3.422	0.00	-200	1544	49.5	135	70.5	14.9
			+30	8.70	371	177	17.2	45.2
WEIGHTED AVG.					51.3	135	70.2	15.1
B-DC03-T-1E	3.376	0.00	-200	1521	43.3	126	67.4	12.9
			+30	10.50	278	392	20	34.1
WEIGHTED AVG.					44.9	128	67.1	13.0
OVERALL RESULT					48.1	132	68.6	14.1
B-DC03-U-1D	3.578	0.00	-200	1621	78.4	496	47.7	20.5
			+30	2.2	28851	39968	2103	2734
WEIGHTED AVG.					117.40	549.5	50.49	24.18
B-DC03-U-1E	3.564	0.00	-200	1616	81.2	557	53.0	20.8
			+30	0.3	51248	332266	24203.00	5090.0
WEIGHTED AVG.					90.70	618.6	57.48	21.74
			+10	324.2	267800	491900	21000	18500
AVG.	139	8.7	-10	57244	104.05	584.03	53.98	22.96
OVERALL RESULT					1612	3351	171.9	127.0
B-DC03-FB-1A	3.85	0.00	-200	1726	6.26	5.17	0.955	6.21
			+30	20.10	0.57	128	13.1	10.0
OVERALL RESULT					6.19	6.58	1.09	6.25
B-DC04-T-1D	2.262	0.00	-200	1023	41.2	110	66.3	13.5
			+30	3.20	331	392	20.9	46.0
WEIGHTED AVG.					42.1	111	66.2	13.6
B-DC04-T-1E	2.232	0.00	-200	1009	44.4	115	64.0	14.4
			+30	3.00	7409	80.8	13.5	815
WEIGHTED AVG.					66.2	115	63.9	16.8
OVERALL RESULT					54.2	113	65.0	15.2

Table G-2.- Total Metals Overall Result Calculations for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
B-DC04-U-1D	3.528	0.00	-200	1596	96.2	489	52.3	26.3
			+30	4.8	15065	29681	1374	1453
WEIGHTED AVG.					141.10	576.6	56.26	30.58
B-DC04-U-1E	3.518	0.00	-200	1590	90.5	487	53.3	23.1
			+30	5.4	13431	15430	898.00	1242.0
WEIGHTED AVG.					135.64	537.6	56.16	27.22
			+10	250.3	267800	491900	21000	18500
AVG.	136	8.8	-10	56019.60	138.37	557.06	56.21	28.90
OVERALL RESULT					1329	2743	149.4	111.1
B-DC05-T-1D	3.072	4.48	-200	1329	52.1	129	76.9	16.2
			+30	2.30	6842	131	11.1	802.0
WEIGHTED AVG.					63.8	129	76.8	17.6
B-DC05-T-1E	3.05	4.76	-200	1309	48.2	125	78.5	14.4
			+30	8.90	582	96.3	13.9	70.1
WEIGHTED AVG.					51.8	125	78.1	14.8
OVERALL RESULT					57.8	127	77.4	16.2
B-DC05-K-1A	3.852	0.00	-200	1726	45.0	974	84.5	8.85
			+30	20.8	37355	21872	1685	4702
WEIGHTED AVG.					489.1	1223	103.6	64.7
B-DC05-K-1B	3.828	0.00	-200	1709	55.0	1025	89.1	8.62
			+30	27.8	18309	16710	1866	2090.0
WEIGHTED AVG.					347.3	1276	117.5	41.9
OVERALL RESULT					418	1249	111	53.3
B-DC05-C-1A	3.600	0.00	-200	1611	32.0	189	30.7	5.06
			+30	21.5	4573	3356	137.0	429.0
WEIGHTED AVG.					91.8	231	32.1	10.6
B-DC05-C-1B	3.672	0.00	-200	1652	19.6	185	31.2	2.61
			+30	13.6	14331	1755.0	180.0	1657
WEIGHTED AVG.					136.5	198	32.4	16.1
OVERALL RESULT					114	214	32.3	13.4
B-DC05-Z-1B	0.337	5.00	-200	145	2091	10924	44.3	190
			+30	0.80	851	5921	18.2	114.0
OVERALL RESULT					2084	10896	44.2	190
B-DC06-T-1D	3.178	1.82	-200	1414	48.3	119	87.8	16.4
			+30	1.60	570	1713	39.0	70.6
WEIGHTED AVG.					48.9	121	87.7	16.5
B-DC06-T-1E	3.248	1.17	-200	1450	51.2	121	89.6	16.9
			+30	6.00	149	981.0	156.0	24
WEIGHTED AVG.					51.6	125	89.9	16.9
OVERALL RESULT					50.2	123	88.8	16.7
B-DC06-P-1A	1.678	20.58	-200	594	8738	21674	475	1443
			+30	10.80	13755	15916	646	2499
OVERALL RESULT					8828	21571	478	1462
B-DC06-L-1A	2.628	0.00	-200	1186	106	405	150	29.1
			+30	5.80	148	442	197	42.6
OVERALL RESULT					106	405	150	29
B-DC06-F-1A	3.376	0.00	-200	1531	88.5	150	105	20.7
			+30	0.00				
OVERALL RESULT					88.5	150	105	20.7

Table G-2. Total Metals Overall Result Calculations for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Composite/ Sample Wt. (lbs.)	Moisture Content (%)	Mesh Size	Dry Weight (g)	Results, mg/kg Cu	Pb	Sb	Zn
B-DC12-T-1D	3.428	0.00	-200	1552	91.7	619	76.0	24.2
			+30	2.70	24858	40325	2251.0	2362.0
WEIGHTED AVG.					134.7	688	79.8	28.3
B-DC12-T-1E	3.27	0.00	-200	1478	86.1	541	74.9	22.1
			+30	5.20	6028	32616.0	1127.0	567
WEIGHTED AVG.					106.9	653	78.6	24.0
OVERALL RESULT					**121**	**671**	**79.2**	**26.1**
B-WZ-A1	2.862	0.00	-200	1101	12.8	10.0	1.48	121
			+8	197	1.23	0.364	0.000	28.3
OVERALL RESULT					**11.0**	**8.54**	**1.26**	**107**
B-WZ-A2	2.998	0.00	-200	1277	18.10	39.5	1.08	140
			+30	82.6	1.51	3.63	0.00	33.5
OVERALL RESULT					**17.1**	**37.3**	**1.01**	**134**
B-WZ-A3	3.276	0.00	-200	1345	27.2	19.6	0.749	117
			+30	140.6	3.48	3.26	0.114	49.0
OVERALL RESULT					**25.0**	**18.1**	**0.689**	**111**

Equations Used for Calculations

1) $(\text{Dry Weight})_{-200\text{ mesh}}$ (g) for Untreated or Treated =
$$[(\text{Composite Wt.} * (100 - \text{Moisture Content})/100) * (453.6)] - (\text{Dry Weight})_{+30\text{ mesh}}$$

2) $(\text{Dry Weight})_{+30\text{ mesh}}$ (g) for Untreated or Treated is a measured value from the lab.

3) $(\text{Dry Weight})_{-10\text{ mesh}}$ (g) for Untreated =
$$[(\text{Composite Wt.} * (100 - \text{Moisture Content})/100) * (453.6)] - (\text{Dry Weight})_{+10\text{ mesh}}$$

4) Weighted Average = $[(\text{Dry Wt.} * \text{Conc.})_{-200\text{ mesh}} + (\text{Dry Wt.} * \text{Conc.})_{+30\text{ mesh}}]/(\text{Dry Wt.})_{-200\text{ mesh} + (+30\text{ mesh})}$

5) Treated Overall Result = $[(\text{Weighted Avg})_D + (\text{Weighted Avg})_E]/2$

6) Avg. = $(\text{Conc.})_{-10\text{ mesh}} = [(\text{Weighted Avg})_D + (\text{Weighted Avg})_E]/2$

7) Untreated Overall Result = $[(\text{Dry Wt.} * \text{Conc.})_{-10\text{ mesh}} + (\text{Dry Wt.} * \text{Conc})_{+10\text{ mesh}}]/(\text{Dry Wt.})_{+10\text{ mesh} + (-10\text{ mesh})}$

Table G-3. Operating Summary for Vendor 2 (Hydrochloric Acid Process)

Date	Daily Soil Fed (tons)	Cumulative Soil Feed (tons)	New (N) vs. Reprocessed (R) Soil	Feed Belt Operating Time (hrs)	Feed Rate (tons/hr)	Treated Belt Operating Time (hrs)	Down Time (hrs)	Process Streams Sampled for Offsite Analysis	Comments
11/15/96	32.0	32.0	N	5.0	6.4	10.0	-	FB,Z,T	Pre-coated filter press with DE; made minor adjustments.
11/16/96	42.0	74.0	N	6.5	6.5	10.0	-	U,T	Raised pitch on the first sand screw.
11/20/96	43.0	117.0	N	8.5	5.1	9.5	0.5	U,T	Downtime: Raised pitch on the first sand screw.
11/21/96	50.0	167.0	N	8.5	5.9	10.0	-	U,T	
11/22/96	63.0	230.0	N	8.5	7.4	10.0	-	U,T,C,K,M	
11/23/96	51.0	281.0	N	8.5	6.0	9.5	0.5	T	Downtime: Replaced motor on jig bed.
11/25/96	47.0	328.0	N	8.5	5.5	10.0	-	U,T,P	
11/26/96	48.0	376.0	N	8.5	5.6	10.0	-	U,T,Q_c,Q_f	
11/27/96	56.0	432.0	N	8.5	6.6	10.0	-	T	
11/29/96	43.0	475.0	N	8.5	5.1	10.0	-	T	
11/30/96	64.0	539.0	N	8.5	7.5	10.0	-	T	
12/2/96	65.0	604.0	N	8.5	7.6	10.0	-	T,F,L	
12/3/96	52.0	656.0	N	7.5	6.9	9.0	-	U,T,FB	Shut down early; bin capacity has been reached.
12/4/96	50.0	706.0	N	8.5	5.9	9.5	0.5	U,T	Downtime: fixed pipe leak on attrition scrubber.
12/5/96	51.0	757.0	N	8.5	6.0	10.0	-	T,Z,C,K	
12/6/96	56.0	813.0	N	8.5	6.6	9.5	0.5	T,Q_c,Q_f,F,L,P	
12/12/96	22.0	835.0	N	4.0	5.5	10.0	-	T	
Totals	-	835.0	-	133.5	6.3	167.0	2.0		

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Table G-4. Utilities and Reagents Usage Summary for Vendor 2 (Hydrochloric Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	Cumulative Power Used (kWH)	Cumulative Water Used (gal)	Cumulative Pond Water Used (gal)	Daily Hydrochloric Acid Used (gal)	Daily Lime Used (lbs)	Daily Sodium Hydroxide Used (gal)	Daily Diatomaceous Earth Used (lbs)	Daily Flocculant Used (lbs)	Daily Organic Accumulation (lbs.)
11/15/96	32.0	32.0	7,000	26,700	0	245	75	300	400	150.0	75.0
11/16/96	42.0	74.0	7,400	27,800	0	250	100	350	400	50.0	90.0
11/20/96	43.0	117.0	7,800	28,500	3,000	300	50	345	550	50.0	192.0
11/21/96	50.0	167.0	8,400	29,500	4,000	300	100	345	450	50.0	200.0
11/22/96	63.0	230.0	9,000	31,700	5,500	315	50	345	750	50.0	210.0
11/23/96	51.0	281.0	9,600	34,200	5,500	300	50	345	650	50.0	190.0
11/25/96	47.0	328.0	10,200	35,200	5,500	345	75	390	900	50.0	230.0
11/26/96	48.0	376.0	10,800	36,600	5,500	345	100	390	200	50.0	156.0
11/27/96	56.0	432.0	11,400	37,900	5,500	345	75	390	900	50.0	320.0
11/29/96	43.0	475.0	12,000	38,200	7,000	345	100	390	200	50.0	206.0
11/30/96	64.0	539.0	12,600	38,400	14,000	345	75	390	900	50.0	190.0
12/2/96	65.0	604.0	13,200	39,600	14,000	305	75	300	500	100.0	193.0
12/3/96	52.0	656.0	13,800	42,000	15,000	305	100	300	450	50.0	263.0
12/4/96	50.0	706.0	14,400	44,100	16,500	305	50	300	550	50.0	503.0
12/5/96	52.0	758.0	15,000	46,000	20,500	400	75	400	450	50.0	253.0

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Table G-4. Utilities and Reagents Usage Summary for Vendor 2 (Hydrochloric Acid Process)

Date	Daily Soil Feed (tons)	Cumulative Soil Feed (tons)	Cumulative Power Used (kWH)	Cumulative Water Used (gal)	Cumulative Pond Water Used (gal)	Daily Hydrochloric Acid Used (gal)	Daily Lime Used (lbs)	Daily Sodium Hydroxide Used (gal)	Daily Diatomaceous Earth Used (lbs)	Daily Flocculant Used (lbs).	Daily Organic Accumulation (lbs.)
12/6/96	55.0	813.0	15,600	47,000	21,500	300	100	400	200	50.0	190.0
12/12/96	22.0	835.0	16,000	49,300	21,500	150	25	200	200	50.0	60.0
Totals	835.0	835.0	16,000	49,300	21,500	5,200	1,275	5,880	8,650	1,000	3,521

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Table G-5. Offsite Samples Summary for Vendor 2 (Hydrochloric Acid Process)

Date	Process Stream	Sample No.	Analysis Requested	Wet Wt./Vol. of Composite (lbs/L)	Moisture Content (%)	Minus 10 mesh soil dry weight (lbs)	Plus 10 mesh dry weight (g)	Comments
11/15/96	Z	B-NV15-Z	TCLP/TOTALS	10 lbs.	40	----	----	Organic sample
11/15/96	T	B-NV15-T	TCLP/TOTALS	70 lbs.	23	----	----	Treated sample taken from output produced on 11/15/96 storage bin #1
11/16/96	U	B-NV16-U	TCLP/TOTALS	150 lbs.	8.2	136.6	491.3	
11/16/96	T	B-NV16-T	TCLP/TOTALS	150 lbs.	35.7	----	----	
11/20/96	U	B-NV20-U	TCLP/TOTALS	225 lbs.	9.1	203.2	617.7	Samples were completely dried and taken through entire sampling process. Lead fraction removed and weighed.
11/20/96	T	B-NV20-T	TCLP/TOTALS	225 lbs.	23.1	----	----	Samples were completely dried and taken through entire sampling process.
11/21/96	U	B-NV21-U	TCLP/TOTALS	150 lbs.	9.6	134.8	357.9	Collected 3-50 lb samples from the input pile, grabbed as front loader removed dirt from pad.
11/21/96	T	B-NV21-T	TCLP/TOTALS	150 lbs.	24.2	----	----	Collected 3-50 lb samples of treated output from the Bescorp soil washing plant.
11/22/96	U	B-NV22-U	TCLP/TOTALS	150 lbs.	8.7	136.0	426.7	Sample of untreated soil from the input pile.
11/22/96	T	B-NV22-T	TCLP/TOTALS	150 lbs.	21.0	----	----	Sample of treated soil from output pile.
11/22/96	C	B-NV22-C	TCLP/TOTALS	42 lbs.	43.1	----	----	Collected sample of 2nd sand screw (coarse) prior to pH adjustment. Collected in conjunction with streams M & K
11/22/96	K	B-NV22-K	TCLP/TOTALS	51 lbs.	39.6	30.4	186.1	Collected 51 lbs. of input soil to the jig. Sample taken from the outlet of 1st screw. Taken with C & M
11/22/96	M	B-NV22-M	TCLP/TOTALS	50 lbs.	57.8	----	----	Sample from soil from jig bed underflow. Stream becoming more concentrated, but still added back to untreated pile
11/23/96	T	B-NV23-T	TCLP/TOTALS	150 lbs.	22.3	----	----	Sample of treated soil from output pile.
11/25/96	U	B-NV25-U	TCLP/TOTALS	136 lbs.	10.3	121.0	465.5	Sample of untreated soil from the input pile.

Table G-5. Offsite Samples Summary for Vendor 2 (Hydrochloric Acid Process)

Date	Process Stream	Sample No.	Analysis Requested	Wet Wt./Vol. of Composite (lbs/L)	Moisture Content (%)	Minus 10 mesh soil dry weight (lbs)	Plus 10 mesh dry weight (g)	Comments
11/25/96	T	B-NV25-T	TCLP/TOTALS	157 lbs.	22.9	----	----	Sample of treated soil from output pile.
11/25/96	P	B-NV25-P	TCLP/TOTALS	41 lbs	63.3	----	----	Sample of precipitate sludge from roll-off bin
11/26/96	U	B-NV26-U	TCLP/TOTALS	136 lbs.	9.2	122.4	483.6	Sample of untreated soil from the input pile.
11/26/96	T	B-NV26-T	TCLP/TOTALS	155 lbs.	22.4	----	----	Sample of treated soil from output pile. Soil is being stored in front of Bin #6 amd Bin #7
11/26/96	Qc,Qf	B-NV26-Qc,Qf	TCLP/TOTALS	1 L	liquid	----	----	Collected 500mL of process sol'n from circulation tank and 500mL of process sol'n from overflow of clarifier #1
11/27/96	T	B-NV27-T	TCLP/TOTALS	156 lbs.	21.6	----	----	Collected 156 lbs. of treated soil from output pile.
11/29/96	T	B-NV29-T	TCLP/TOTALS	151 lbs.	----	----	----	Sample of treated soil from Bin #1 soil pile.
11/30/96	T	B-NV30-T	TCLP/TOTALS	147 lbs.	----	----	----	Sample of treated soil from Bin #2 soil pile.
12/2/96	T	B-DC02-T	TCLP/TOTALS	158 lbs.	22.4	----	----	Sample of treated soil from output pile.
12/2/96	F	B-DC02-F	TCLP/TOTALS	77 lbs.	20.5	----	----	Collected 77 lbs. of soil from the fines output from the centrifuge.
12/2/96	L	B-DC02-L	TCLP/TOTALS	97 lbs.	liquid	----	----	Collected 97 lbs. of liquid/soil from the overflow of the first sand screw.
12/3/96	U	B-DC03-U	TCLP/TOTALS	139 lbs.	8.7	126.2	324.2	Sample of untreated soil from the input pile.
12/3/96	T	B-DC03-T	TCLP/TOTALS	157 lbs.	22.1	----	----	Sample of treated soil from output pile.
12/3/96	FB	B-DC03-FB	TCLP/TOTALS	52 lbs.	0.0	----	----	Processed 52 lbs. of Decon sand through the sampling equipment.
12/4/96	U	B-DC04-U	TCLP/TOTALS	136 lbs.	8.8	123.5	250.3	Sample of untreated soil from the input pile.

Table G-5. Offsite Samples Summary for Vendor 2 (Hydrochloric Acid Process)

Date	Process Stream	Sample No.	Analysis Requested	Wet Wt./Vol. of Composite (lbs/L)	Moisture Content (%)	Minus 10 mesh soil dry weight (lbs)	Plus 10 mesh dry weight (g)	Comments
12/4/96	T	B-DC04-T	TCLP/TOTALS	159 lbs.	19.4	----	----	Sample of treated soil from output pile.
12/5/96	T	B-DC05-T	TCLP/TOTALS	155 lbs.	19.1	----	----	Sample of treated soil from output pile.
12/5/96	Z	B-DC05-Z	TCLP/TOTALS	30 lbs.	----	----	----	Organic dried overnight and placed into 2-500mL jars, combined for analyzation.
12/5/96	C	B-DC05-C	TCLP/TOTALS	76 lbs.	20.2	----	----	Collected sample of coarse output from sand screw.
12/5/96	K	B-DC05-K	TCLP/TOTALS	90 lbs.	18.2	73.6	26.5	Sample collected from outp[ut of first sand screw.
12/6/96	T	B-DC06-T	TCLP/TOTALS	152 lbs.	21.1	----	----	Sample of treated soil from output pile.
12/6/96	F	B-DC06-F	TCLP/TOTALS	55 lbs.	20.9	----	----	Collected 55 lbs. of soil from the fines output from the centrifuge.
12/6/96	L	B-DC06-L	TCLP/TOTALS	66 lbs.	liquid	----	----	Liquid/soil from the overflow of first sand screw
12/6/96	P	B-DC06-P	TCLP/TOTALS	52 lbs.	62.5	----	----	Sample of precipitate sludge from 2nd sludge bin.
12/6/96	Qc, Qf	B-DC06-Qc,Qf	TCLP/TOTALS	1 L	liquid	----	----	Collected 500mL of process sol'n from circulation tank and 500mL of process sol'n from overflow of clarifier #1
12/12/96	T	B-DC12-T	TCLP/TOTALS	50 lbs.	22.3	----	----	Sample of treated soil from output pile.

Table G-6. Laboratory Sample Preparation and Data for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Type Analysis	pH	Wet Wt. (lbs)	Dry Wt. (lbs)	Moisture Content	+30 Mesh Wt. (g)	Comments
B-NV14-FB-1A	TCLP						
B-NV15-T-1A	TCLP	5.70	3	3	0.00%	-	
B-NV15-T-1B	TCLP	5.90	3.03	3.03	0.00%	-	
B-NV15-T-1D	Metals	-	2.97	2.7	9.09%	1.7	
B-NV15-T-1E	Metals	-	2.7	2.45	9.26%	1	
B-NV15-Z-1A	TCLP		0.54	-	-	-	100g taken for TCLP before
B-NV15-Z-1A	Metals	-	0.316	0.16	49.37%	2.3	drying. (.316 lbs. left for metals)
B-NV16-U-1A	TCLP	5.00	3.34	3.34	0.00%	-	
B-NV16-U-1B	TCLP	5.00	3.32	3.32	0.00%	-	
B-NV16-U-1D	Metals	-	1.20	1.176	1.84%	5.8	
B-NV16-U-1E	Metals	-	3.464	3.37	2.71%	10.7	
B-NV16-U-1L	Weight	-	1.082	1.082	0.00%	-	
B-NV16-T-1A	TCLP	6.84	3	3	0.00%	-	
B-NV16-T-1B	TCLP	7.01	3.00	3	0.00%	-	
B-NV16-T-1D	Metals	-	3.16	3.16	0.00%	8.3	
B-NV16-T-1E	Metals	-	3.44	3.44	0.00%	10.90	
B-NV20-U-1A	TCLP	5.17	3.71	3.71	0.00%	-	Use proc. 7.1.4.3 pH=2.0
B-NV20-U-1B	TCLP	-	3.7	3.7	0.00%	-	
B-NV20-U-1D	Metals	-	3.356	3.326	0.89%	14.2	
B-NV20-U-1E	Metals	-	3.352	3.334	0.54%	13.4	
B-NV20-T1-A	TCLP	6.50	3.128	3.128	0.00%	-	
B-NV20-T1-B	TCLP	-	2.994	2.994	0.00%	-	
B-NV20-T1-D	Metals	-	2.892	2.83	2.14%	13.3	
B-NV20-T1-E	Metals	-	2.99	2.93	2.01%	8.2	
B-NV21-U-1A	TCLP	5.10	3.32	3.32	0.00%	-	
B-NV21-U-1B	TCLP	-	3.58	3.58	0.00%	-	
B-NV21-U-1D	Metals	-	3.646	3.65	0.00%	6.5	
B-NV21-U-1E	Metals	-	3.396	3.396	0.00%	16	
B-NV21-U-1L	Weight	-	0.786	0.786	0.00%	-	
B-NV21-T-1A	TCLP	6.70	3.2	damp		-	
B-NV21-T-1B	TCLP	-	2.95	damp		-	
B-NV21-T-1D	Metals	-	2.862	2.86	0.00%	3.9	
B-NV21-T-1E	Metals	-	2.83	2.83	0.00%	6.4	
B-NV22-T-1A	TCLP	8.91	3.104	3.104	0.00%	-	bone dry
B-NV22-T-1B	TCLP	-	3.146	3.146	0.00%	-	bone dry
B-NV22-T-1D	Metals	-	3.018	3.018	0.00%	3.2	
B-NV22-T-1E	Metals	-	2.986	2.986	0.00%	6.7	
B-NV22-U-1A	TCLP	5.12	2.968	2.968	0.00%	-	
B-NV22-U-1B	TCLP	-	3.256	3.256	0.00%	-	Lost? Used NV22URT
B-NV22-U-RT	TCLP	-	2.996	2.996	0.00%	-	
B-NV22-U-1D	Metals	-	2.904	2.79	3.93%	10.2	
B-NV22-U-1E	Metals	-	2.856	2.748	3.78%	10.1	
B-NV22-C-1A	TCLP/Metals	5.59	3.504	3.504	0.00%	22.0	5.59 initial pH then w/ HCl pH=2.03
B-NV22-C-1B	TCLP	-	3.64	3.64	0.00%	30.6	
B-NV22-K-1A	TCLP	-	3.362	3.362	0.000%	-	
B-NV22-K-1A	Metals	-	2.916	2.904	0.412%	22.6	
B-NV22-K-1B	TCLP	-	3.424	3.424	0.000%	-	
B-NV22-K-1B	Metals	-	3.2	3.18	0.625%	11.0	
B-NV22-M-1A	TCLP	-	3.592	3.592	0.00%	-	
B-NV22-M-1A	Metals	-	3.138	3.128	0.319%	38.3	Weights of sample after TCLP taken (100g)
B-NV23-T-1A	TCLP	7.50	2.74	2.63	3.70%	-	
B-NV23-T-1B	TCLP	-	2.724	2.62	3.70%	-	
B-NV23-T-1D	Metals	-	2.76	2.66	3.70%	7.8	
B-NV23-T-1E	Metals	-	2.86	2.75	3.70%	11.5	

- = Not Requested/Applicable

Table G-6. Laboratory Sample Preparation and Data for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Type Analysis	pH	Wet Wt. (lbs)	Dry Wt. (lbs)	Moisture Content	+30 Mesh Wt. (g)	Comments
B-NV25-T-1A	TCLP	9.60	3.028	3.03	0.00%	-	
B-NV25-T-1B	TCLP	-	3.15	3.15	0.00%	-	
B-NV25-T-1D	Metals	-	3.25	3.25	0.00%	12.1	
B-NV25-T-1E	Metals	-	3.234	3.23	0.00%	12.1	
B-NV25-U-1A	TCLP	-	3.324	3.324	0.00%	-	
B-NV25-U-1B	TCLP	-	3.256	3.256	0.00%	-	
B-NV25-U-1D	Metals	-	3.442	3.442	0.00%	23.6	
B-NV25-U-1E	Metals	-	3.37	3.37	0.00%	15	
B-NV25-U-1L	TCLP/Metals	-	1.03	1.03	0.00%	-	
B-NV25-P-1A	TCLP/Metals	7.74	1.208	1.208	0.00%	0.9	
B-NV26-T-1A	TCLP	7.54	3.402	3.402	0.00%	-	
B-NV26-T-1B	TCLP	-	3.306	3.306	0.00%	-	
B-NV26-T-1D	Metals	-	3.386	3.386	0.00%	14.8	
B-NV26-T-1E	Metals	-	3.38	3.38	0.00%	4.6	
B-NV26-U-1A	TCLP	5.51	3.498	3.498	0.00%	-	
B-NV26-U-1B	TCLP	-	3.514	3.514	0.00%	-	
B-NV26-U-1D	Metals	-	3.432	3.432	0.00%	4.6	
B-NV26-U-1E	Metals	-	3.4	3.4	0.00%	3.7	
B-NV26-U-1L	TCLP/Metals	-	1.078	1.078	0.00%	-	
B-NV26-Qf-1A	Metals	1.56	1.526	-	-	-	
B-NV26-Qc-1A	Metals	1.45	1.430	-	-	-	
B-NV27-T-1A	TCLP	4.94	3.612	3.612	0.00%	-	
B-NV27-T-1B	TCLP	-	3.54	3.54	0.00%	-	
B-NV27-T-1D	Metals	-	3.512	3.512	0.00%	8.6	
B-NV27-T-1E	Metals	-	3.51	3.51	0.00%	6.8	
B-NV29-T-1A	TCLP	4.72	3.182	3.182	0.00%	-	
B-NV29-T-1B	TCLP	-	3.154	3.154	0.00%	-	
B-NV29-T-1D	Metals	-	3.324	3.324	0.00%	15.9	
B-NV29-T-1E (C)	Metals	-	3.482	3.482	0.00%	15.7	
B-NV30-T-1A	TCLP	4.96	3.44	3.44	0.00%	-	
B-NV30-T-1B	TCLP	-	3.364	3.364	0.00%	-	
B-NV30-T-1D	Metals	-	3.324	3.324	0.00%	6.8	
B-NV30-T-1E (C)	Metals	-	3.296	3.296	0.00%	15	
B-DC02-T-1A	TCLP	9.02	3.054	moist	-	-	pH kept creeping up
B-DC02-T-1B	TCLP	-	3.088	moist	-	-	
B-DC02-T-1D	Metals	-	2.902	2.862	1.38%	7.5	
B-DC02-T-1E	Metals	-	2.918	2.826	3.15%	8.7	
B-DC02-L-1A	TCLP/Metals	-	2.976	2.976	0.00%	7.3	
B-DC02-F-1A	TCLP/Metals	-	3.128	3.128	0.00%	1.7	
B-DC03-T-1A	TCLP	6.99	3.516	3.516	0.00%	-	
B-DC03-T-1B	TCLP	-	3.488	3.488	0.00%	-	
B-DC03-T-1D	Metals	-	3.422	3.422	0.00%	8.7	
B-DC03-T-1E	Metals	-	3.376	3.376	0.00%	10.5	
B-DC03-U-1A	TCLP	5.52	3.570	3.570	0.00%	-	
B-DC03-U-1B	TCLP	-	3.440	3.440	0.00%	-	
B-DC03-U-1D	Metals	-	3.578	3.578	0.00%	2.2	
B-DC03-U-1E	Metals	-	3.564	3.564	0.00%	0.3	
B-DC03-U-1L	+10	-	0.71	0.71	0.00%	-	
B-DC03-FB-1A	TCLP/Metals	-	3.850	3.850	0.00%	20.1	
B-DC04-T-1A	TCLP	5.53	2.322	2.322	0.00%	-	
B-DC04-T-1B	TCLP	-	2.306	2.306	0.00%	-	
B-DC04-T-1D	Metals	-	2.262	2.262	0.00%	3.2	
B-DC04-T-1E	Metals	-	2.232	2.232	0.00%	3	

- = Not Requested/Applicable

Table G-6. Laboratory Sample Preparation and Data for Vendor 2 (Hydrochloric Acid Process)

Sample No.	Type Analysis	pH	Wet Wt. (lbs)	Dry Wt. (lbs)	Moisture Content	+30 Mesh Wt. (g)	Comments
B-DC04-U-1A	TCLP	5.05	3.478	3.478	0.00%	-	
B-DC04-U-1B	TCLP	-	3.434	3.434	0.00%	-	
B-DC04-U-1D	Metals	-	3.528	3.528	0.00%	4.8	
B-DC04-U-1E	Metals	-	3.518	3.518	0.00%	5.4	
B-DC05-T-1A	TCLP		2.992	2.992	0.00%	-	
B-DC05-T-1B	TCLP	-	2.984	2.984	0.00%	-	
B-DC05-T-1D	Metals	-	3.072	2.934	4.48%	2.3	
B-DC05-T-1E	Metals	-	3.050	2.905	4.76%	8.9	
B-DC05-C-1A	TCLP/Metals	-	3.600	3.600	0.00%	21.5	
B-DC05-C-1B	TCLP/Metals	-	3.672	3.672	0.00%	13.6	
B-DC05-K-1A	TCLP/Metals	-	3.852	3.852	0.00%	20.8	+30 contains lead bullets
B-DC05-K-1B	TCLP/Metals	-	3.828	3.828	0.00%	27.8	+30 contains lead bullets
B-DC05-Z1A/B	TCLP/Metals	-	0.120	0.114	5.00%	0.8	Sample 1A and 1B combined into one(1A)
B-DC06-T-1A	TCLP	8.05	3.332	3.332	0.00%	-	
B-DC06-T-1B	TCLP	-	3.228	3.228	0.00%	-	
B-DC06-T-1D	Metals	-	3.178	3.120	1.82%	1.6	
B-DC06-T-1E	Metals	-	3.248	3.210	1.17%	6.0	
B-DC06-L-1A	TCLP/Metals	-	2.628	2.628	0.00%	5.8	+30 Contains some organic material
B-DC06-F-1A	TCLP/Metals	-	3.376	3.376	0.00%	0.0	
B-DC06-P-1A	TCLP	-	1.678		moist	-	first tumbing/grinding developed cakes of
B-DC06-P-1A	Metals	-	1.108	0.88	20.58%	10.8	soil (some material lost during cleanup)
B-DC06-Qc-1A	Metals	1.40	-	-	-	-	solution
B-DC06-Qf-1A	Metals	1.50	-	-	-	-	
B-DC12-T-1A	TCLP	8.36	3.11	3.11	0.00%	-	
B-DC12-T-1B	TCLP	-	3.498	3.498	0.00%	-	
B-DC12-T-1D	Metals	-	3.428	3.428	0.00%	2.7	
B-DC12-T-1E	Metals	-	3.27	3.27	0.00%	5.2	

- = Not Requested/Applicable

Analytical Data

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-NV14-FB-1A	TCLP	100.3	µg/mL	0.055	0.000	0.000	0.892
B-NV14-FB-1A	TCLP	100.1	µg/mL	0.041	0.000	0.003	0.035
B-NV14-FB-1A Average	**TCLP**		**µg/mL**	**0.048**	**0.000**	**0.002**	**0.463**
Standard Deviation				**0.010**	**0.000**	**0.002**	**0.606**
Percent RSD				**21%**	**0%**	**141%**	**131%**
B-NV14-FB-1A	-200 TM	8.4321	µg/g	8.29	0.254	0.007	7.13
B-NV14-FB-1A	-200 TM	8.0899	µg/g	9.87	1.52	0.502	8.60
B-NV14-FB-1A	-200 TM	8.2738	µg/g	8.13	0.945	0.534	7.23
B-NV14-FB-1A	-200 TM	8.1833	µg/g	9.51	0.577	0.049	7.30
B-NV14-FB-1A Average	**-200 TM**		**µg/g**	**8.95**	**0.823**	**0.273**	**7.57**
Standard Deviation				**0.866**	**0.542**	**0.284**	**0.694**
Percent RSD				**10%**	**66%**	**104%**	**9.2%**
B-NV14-FB-1A (1)	+30 TM	8.0600	µg/g	1.60	2.17	0.000	10.6
B-NV14-FB-1A (2)	+30 TM	8.5547	µg/g	1.57	1.38	0.000	10.1
B-NV14-FB-1A (3)	+30 TM	6.3040	µg/g	3.54	1.76	0.000	10.6
B-NV14-FB-1A Weighted Ave.	**+30 TM**		**µg/g**	**2.12**	**1.76**	**0.00**	**10.4**
B-NV15-T-1A	TCLP		µg/mL	0.164	0.935	0.079	0.161
B-NV15-T-1A	TCLP		µg/mL	0.133	1.95	0.134	0.099
B-NV15-T-1A Average	TCLP		µg/mL	0.149	1.44	0.107	0.130
B-NV15-T-1B	TCLP		µg/mL	0.159	0.805	0.072	0.140
B-NV15-T-1B	TCLP		µg/mL	0.117	0.715	0.062	0.134
B-NV15-T-1B Average	TCLP		µg/mL	0.138	0.760	0.067	0.137
B-NV15-T-1 Average	**TCLP**		**µg/mL**	**0.143**	**1.10**	**0.087**	**0.134**
Standard Deviation				**0.007**	**0.482**	**0.028**	**0.005**
Percent RSD				**5.2%**	**44%**	**32%**	**3.7%**
B-NV15-T-1D	-200 TM	8.4290	µg/g	51.3	122	53.9	17.8
B-NV15-T-1D	-200 TM	7.8500	µg/g	50.8	205	58.7	17.8
B-NV15-T-1D Average	**-200 TM**		**µg/g**	**51.1**	**163**	**56.3**	**17.8**
Standard Deviation				**0.351**	**58.6**	**3.40**	**0.026**
Percent RSD				**0.7%**	**36%**	**6.0%**	**0.14%**
B-NV15-T-1D	**+30 TM**	**1.6408**	**µg/g**	**0.000**	**22.4**	**2.80**	**5.48**
B-NV15-T-1E	-200 TM	8.3111	µg/g	49.8	125	56.4	17.7
B-NV15-T-1E	-200 TM	8.0954	µg/g	48.3	122	55.7	17.3
B-NV15-T-1E Average	**-200 TM**		**µg/g**	**49.0**	**124**	**56.1**	**17.5**
Standard Deviation				**1.02**	**1.89**	**0.475**	**0.268**
Percent RSD				**2.1%**	**1.5%**	**0.85%**	**1.5%**
B-NV15-T-1E	**+30 TM**	**1.0022**	**µg/g**	**0.000**	**53.3**	**8.46**	**9.29**
B-NV15-Z-1A	TCLP		µg/mL	1.73	6.74	0.038	1.42
B-NV15-Z-1A DUP	TCLP		µg/mL	1.72	6.76	0.033	1.37
B-NV15-Z-1 Average	**TCLP**		**µg/mL**	**1.73**	**6.75**	**0.036**	**1.40**
Standard Deviation				**0.007**	**0.014**	**0.004**	**0.035**
Percent RSD				**0.41%**	**0.21%**	**10.0%**	**2.5%**
B-NV15-Z-1A	TM	2.0019	µg/g	2840	14127	51.2	227
B-NV15-Z-1A	TM	2.0023	µg/g	2899	14378	45.3	250
B-NV15-Z-1 Average	**TM**		**µg/g**	**2869**	**14253**	**48.2**	**238**
Standard Deviation				**42.0**	**178**	**4.10**	**16.0**

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Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Percent RSD				1.5%	1.2%	8.5%	6.7%
B-NV16-T-1A	TCLP		µg/mL	0.145	2.99	0.424	0.176
B-NV16-T-1A	TCLP		µg/mL	0.163	1.87	0.360	0.167
B-NV16-T-1A	TCLP		µg/mL	0.154	2.43	0.392	0.172
B-NV16-T-1B	TCLP		µg/mL	0.176	1.31	0.342	0.171
B-NV16-T-1B	TCLP		µg/mL	0.170	1.13	0.350	0.148
B-NV16-T-1B	TCLP		µg/mL	0.173	1.220	0.346	0.160
B-NV16-T-1 Average	TCLP		µg/mL	0.164	1.83	0.369	0.166
Standard Deviation				0.013	0.856	0.033	0.008
Percent RSD				8.2%	47%	8.8%	5.1%
B-NV16-T-1D	-200 TM	8.3409	µg/g	48.0	172	63.5	14.3
B-NV16-T-1D	-200 TM	8.1910	µg/g	48.2	177	66.8	14.4
B-NV16-T-1D Average	-200 TM		µg/g	48.1	174	65.1	14.4
Standard Deviation				0.104	3.97	2.38	0.097
Percent RSD				0.22%	2.3%	3.6%	0.68%
B-NV16-T-1D+30	+30 TM	8.4595	µg/g	411	924	139	48.2
B-NV16-T-1E	-200 TM	8.2743	µg/g	46.0	166	63.8	14.0
B-NV16-T-1E	-200 TM	8.0078	µg/g	45.4	164	64.0	14.0
B-NV16-T-1E Average	-200 TM		µg/g	45.7	165	63.9	14.0
Standard Deviation				0.471	1.44	0.12	0.041
Percent RSD				1.0%	0.87%	0.19%	0.29%
B-NV16-T-1E+30	+30 TM	10.8709	µg/g	224	2000	2.70	15.5
B-NV16-U-1A	TCLP	100.9	µg/mL	0.824	24.2	0.182	0.337
B-NV16-U-1A	TCLP	100.1	µg/mL	0.604	15.1	0.079	0.313
B-NV16-U-1A	TCLP		µg/mL	0.714	19.7	0.130	0.325
B-NV16-U-1B	TCLP	101.5	µg/mL	2.50	23.6	0.295	0.396
B-NV16-U-1B	TCLP	101.1	µg/mL	0.544	10.7	0.058	0.346
B-NV16-U-1B	TCLP		µg/mL	1.52	17.2	0.177	0.371
B-NV16-U-1 Average	TCLP		µg/mL	1.12	18.4	0.154	0.348
Standard Deviation				0.572	1.78	0.033	0.033
Percent RSD				51%	10%	21%	9.4%
B-NV16-U-1D	-200 TM	8.0088	µg/g	109	773	77.9	27.0
B-NV16-U-1D	-200 TM	8.1490	µg/g	109	772	79.6	27.1
B-NV16-U-1D	-200 TM	8.1579	µg/g	117	797	82.1	28.6
B-NV16-U-1D	-200 TM	8.0990	µg/g	111	790	81.0	27.9
B-NV16-U-1D Average	-200 TM		µg/g	112	783	80.2	27.6
Standard Deviation				3.54	12.1	1.78	0.737
Percent RSD				3.2%	1.5%	2.2%	2.7%
B-NV16-U-1D	+30 TM	5.8038	µg/g	11210	26155	1561	1119
B-NV16-U-1E	-200 TM	8.1536	µg/g	126	763	79.7	29.8
B-NV16-U-1E	-200 TM	8.3889	µg/g	113	763	79.2	27.8
B-NV16-U-1E Average	-200 TM		µg/g	120	763	79.4	28.8
Standard Deviation				8.99	0.131	0.401	1.35
Percent RSD				7.5%	0.02%	0.50%	4.7%
B-NV16-U-1E	+30 TM	10.6750	µg/g	6000	13930	705	583
B-NV20-T-1A	TCLP	100.6	µg/mL	0.088	1.00	0.349	0.110

Fort Polk Demonstration Project
Data Summary

5/13/97
1:30 PM

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-NV20-T-1A	TCLP	100.5	µg/mL	0.065	0.837	0.357	0.081
B-NV20-T-1A	TCLP		µg/mL	0.077	0.917	0.353	0.095
B-NV20-T-1B	TCLP	100.1	µg/mL	0.070	0.895	0.350	0.055
B-NV20-T-1B	TCLP	100.3	µg/mL	0.096	1.10	0.305	0.101
B-NV20-T-1B	TCLP		µg/mL	0.083	1.00	0.328	0.078
B-NV20-T-1 Average	TCLP		µg/mL	0.080	0.958	0.340	0.087
Standard Deviation				0.005	0.058	0.018	0.012
Percent RSD				5.8%	6.1%	5.2%	14%
B-NV20-T-1D	-200 TM	7.9943	µg/g	56.1	131	55.5	17.5
B-NV20-T-1D	-200 TM	8.2287	µg/g	52.0	126	56.2	16.9
B-NV20-T-1D Average	-200 TM		µg/g	54.1	129	55.9	17.2
Standard Deviation				2.92	3.69	0.532	0.449
Percent RSD				5.4%	2.9%	1.0%	2.6%
B-NV20-T-1D	+30 TM	7.5182	µg/g	230	166	5.17	47.2
B-NV20-T-1D	+30 TM	5.8129	µg/g	408	102	2.94	93.1
B-NV20-T-1D Weighted Average	+30 TM		µg/g	308	138	4.20	67.2
B-NV20-T-1E	-200 TM	12.6420	µg/g	52.5	123	54.7	16.6
B-NV20-T-1E	-200 TM	12.4100	µg/g	49.6	122	51.2	15.8
B-NV20-T-1E Average	-200 TM		µg/g	51.0	122	52.9	16.2
Standard Deviation				2.06	1.21	2.48	0.532
Percent RSD				4.0%	1.0%	4.7%	3.3%
B-NV20-T-1E	+30 TM	12.7611	µg/g	131	76.1	7.95	27.1
B-NV20-U-1A	TCLP	100.2	µg/mL	1.09	24.5	0.166	0.325
B-NV20-U-1A	TCLP	100.7	µg/mL	1.46	20.3	0.093	0.366
B-NV20-U-1A	TCLP		µg/mL	1.27	22.4	0.129	0.346
B-NV20-U-1B	TCLP	100.6	µg/mL	1.04	18.6	0.075	0.297
B-NV20-U-1B	TCLP	100.3	µg/mL	0.805	19.3	0.057	0.332
B-NV20-U-1B	TCLP		µg/mL	0.921	18.9	0.066	0.314
B-NV20-U-1 Average	TCLP		µg/mL	1.10	20.7	0.098	0.330
Standard Deviation				0.248	2.45	0.045	0.022
Percent RSD				23%	12%	46%	6.7%
B-NV20-U-1D	-200 TM	8.1688	µg/g	99.5	723	66.3	26.2
B-NV20-U-1D	-200 TM	8.3951	µg/g	101	794	65.5	26.4
B-NV20-U-1D Average	-200 TM		µg/g	100	759	65.9	26.3
Standard Deviation				1.25	50.6	0.522	0.141
Percent RSD				1.2%	6.7%	0.79%	0.54%
B-NV20-U-1D (1)	+30 TM	8.4641	µg/g	10047	17521	1070	910
B-NV20-U-1D (2)	+30 TM	5.7306	µg/g	2143	17365	638	224
B-NV20-U-1D Weighted Average	+30 TM		µg/g	6856	17458	895	633
B-NV20-U-1E	-200 TM	7.9888	µg/g	120	734	70.2	30.4
B-NV20-U-1E	-200 TM	7.9400	µg/g	105	742	72.7	27.2
B-NV20-U-1E Average	-200 TM		µg/g	112	738	71.4	28.8
Standard Deviation				10.7	5.33	1.77	2.25
Percent RSD				9.5%	0.72%	2.5%	7.8%
B-NV20-U-1E	+30 TM	13.3550	µg/g	8491	13126	902	1017
B-NV21-T-1A	TCLP	100.2	µg/mL	0.147	1.34	0.517	0.226

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Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-NV21-T-1A	TCLP	101.6	µg/mL	0.154	1.26	0.453	0.521
B-NV21-T-1A	TCLP		µg/mL	0.151	1.30	0.485	0.374
B-NV21-T-1B	TCLP	100.0	µg/mL	0.161	1.42	0.481	0.416
B-NV21-T-1B	TCLP	100.1	µg/mL	0.159	1.26	0.487	0.576
B-NV21-T-1B	TCLP		µg/mL	0.160	1.34	0.484	0.496
B-NV21-T-1 Average	TCLP		µg/mL	0.155	1.32	0.485	0.435
Standard Deviation				0.007	0.025	0.000	0.087
Percent RSD				4.2%	1.9%	0.10%	20%
B-NV21-T-1D	-200 TM	8.1170	µg/g	69.0	147	81.1	19.4
B-NV21-T-1D	-200 TM	7.9379	µg/g	56.6	129	81.1	17.4
B-NV21-T-1D Average	-200 TM		µg/g	62.8	138	81.1	18.4
Standard Deviation				8.77	12.4	0.028	1.44
Percent RSD				14%	9.0%	0.04%	7.8%
B-NV21-T-1D	+30 TM	3.8696	µg/g	770	71.0	9.09	163.7
B-NV21-T-1E	-200 TM	8.0540	µg/g	56.2	134	82.5	18.1
B-NV21-T-1E	-200 TM	8.4587	µg/g	54.5	127	77.5	17.8
B-NV21-T-1E Average	-200 TM		µg/g	55.3	130	80.0	17.9
Standard Deviation				1.16	5.02	3.51	0.190
Percent RSD				2.1%	3.9%	4.4%	1.1%
B-NV21-T-1E	+30 TM	6.3546	µg/g	140	88.1	9.52	63.5
B-NV21-U-1A	TCLP	100.5	µg/mL	0.548	15.6	0.058	0.651
B-NV21-U-1A	TCLP	101.2	µg/mL	0.619	21.9	0.222	0.272
B-NV21-U-1A	TCLP		µg/mL	0.583	18.8	0.140	0.461
B-NV21-U-1B	TCLP	100.9	µg/mL	0.825	54.3	0.171	0.266
B-NV21-U-1B	TCLP	100.4	µg/mL	2.65	57.3	0.301	0.369
B-NV21-U-1B	TCLP		µg/mL	1.74	55.8	0.236	0.318
B-NV21-U-1 Average	TCLP		µg/mL	1.16	37.3	0.188	0.389
Standard Deviation				0.815	26.2	0.067	0.102
Percent RSD				70%	70%	36%	26%
B-NV21-U-1D	-200 TM	8.2369	µg/g	87.6	691	67.4	26.9
B-NV21-U-1D	-200 TM	7.9577	µg/g	91.8	692	65.2	27.8
B-NV21-U-1D Average	-200 TM		µg/g	89.7	691	66.3	27.4
Standard Deviation				2.99	0.966	1.53	0.667
Percent RSD				3.3%	0.14%	2.3%	2.4%
B-NV21-U-1D	+30 TM	6.4705	µg/g	1647	14966	1029	178
B-NV21-U-1E	-200 TM	8.1858	µg/g	92.7	599	62.8	27.8
B-NV21-U-1E	-200 TM	8.0984	µg/g	92.3	605	62.5	28.2
B-NV21-U-1E Average	-200 TM		µg/g	92.5	602	62.7	28.0
Standard Deviation				0.270	4.22	0.219	0.247
Percent RSD				0.29%	0.70%	0.35%	0.88%
B-NV21-U-1E (1)	+30 TM	8.1162	µg/g	516	2791	296	68.8
B-NV21-U-1E (2)	+30 TM	8.2362	µg/g	2472	11471	529	228
B-NV21-U-1E Weighted Average	+30 TM		µg/g	1501	7163	414	149
B-NV22-T-1A	TCLP	100.7	µg/mL	0.070	0.700	0.717	0.090
B-NV22-T-1A	TCLP	100.6	µg/mL	0.006	0.598	0.640	0.079
B-NV22-T-1A	TCLP		µg/mL	0.038	0.65	0.679	0.085

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
3-NV22-T-1B	TCLP	101.0	µg/mL	0.011	0.495	0.680	0.350
3-NV22-T-1B	TCLP	100.3	µg/mL	0.002	0.448	0.672	0.060
3-NV22-T-1B	TCLP		µg/mL	0.006	0.47	0.676	0.205
3-NV22-T-1 Average	TCLP		µg/mL	0.022	0.56	0.677	0.145
tandard Deviation				0.022	0.125	0.002	0.085
ercent RSD				101%	22%	0.29%	59%
3-NV22-T-1D	-200 TM	7.9976	µg/g	62.5	112	91.5	21.0
3-NV22-T-1D	-200 TM	8.4122	µg/g	63.8	115	91.6	21.2
3-NV22-T-1D Average	-200 TM		µg/g	63.2	114	91.6	21.1
tandard Deviation				0.967	1.78	0.11	0.126
ercent RSD				1.5%	1.6%	0.1%	0.60%
3-NV22-T-1D	+30 TM	3.2151	µg/g	47.0	51.7	13.2	28.1
3-NV22-T-1E	-200 TM	8.0299	µg/g	62.4	115	82.6	21.2
3-NV22-T-1E	-200 TM	8.1712	µg/g	62.9	113	91.0	21.4
3-NV22-T-1E Average	-200 TM		µg/g	62.6	114	86.8	21.3
tandard Deviation				0.292	1.27	5.95	0.111
ercent RSD				0.5%	1.1%	6.9%	0.52%
3-NV22-T-1E	+30 TM	6.6324	µg/g	61.3	368	24.7	18.6
3-NV22-U-1A	TCLP	100.8	µg/mL	0.842	12.8	0.156	0.381
3-NV22-U-1A	TCLP	100.3	µg/mL	0.678	25.7	0.176	0.377
3-NV22-U-1A	TCLP		µg/mL	0.760	19.3	0.166	0.379
3-NV22-U-Rt	TCLP	100.2	µg/mL	1.39	21.6	0.048	0.356
3-NV22-U-Rt	TCLP	100.3	µg/mL	0.740	73.7	0.335	0.354
3-NV22-U-1Rt	TCLP		µg/mL	1.066	47.7	0.191	0.355
3-NV22-U-1 Average	TCLP		µg/mL	0.913	33.5	0.179	0.367
tandard Deviation				0.216	20.1	0.018	0.017
ercent RSD				24%	60%	10%	4.5%
3-NV22-U-1D	-200 TM	8.0993	µg/g	84.9	609	60.1	23.8
3-NV22-U-1D	-200 TM	8.2865	µg/g	86.1	600	59.0	23.7
3-NV22-U-1D Average	-200 TM		µg/g	85.5	604	59.5	23.7
tandard Deviation				0.880	6.66	0.720	0.028
ercent RSD				1.0%	1.1%	1.2%	0.12%
3-NV22-U-1D	+30 TM	10.2121	µg/g	7655	15491	695	731
3-NV22-U-1E	-200 TM	8.0300	µg/g	85.6	589	54.9	25.8
3-NV22-U-1E	-200 TM	8.0414	µg/g	95.0	603	57.9	26.7
3-NV22-U-1E Average	-200 TM		µg/g	90.3	596	56.4	26.3
tandard Deviation				6.67	9.61	2.09	0.642
ercent RSD				7.4%	1.6%	3.7%	2.4%
3-NV22-U-1E	+30 TM	10.0932	µg/g	4668	9025	372	473
3-NV22-C-1A	TCLP	100.7	µg/mL	0.230	4.18	0.013	0.059
3-NV22-C-1A	TCLP	100.1	µg/mL	0.253	4.39	0.000	0.071
3-NV22-C-1A	TCLP		µg/mL	0.242	4.29	0.007	0.065
3-NV22-C-1B	TCLP	100.4	µg/mL	0.292	4.43	0.011	0.051
3-NV22-C-1B	TCLP	100.3	µg/mL	0.312	4.64	0.021	0.292
3-NV22-C-1B	TCLP		µg/mL	0.302	4.54	0.016	0.172
3-NV22-C-1 Average	TCLP		µg/mL	0.272	4.41	0.011	0.118

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Standard Deviation				0.042	0.178	0.007	0.075
Percent RSD				16%	4.0%	58%	64%
B-NV22-C-1A	-200 TM	8.4357	µg/g	17.9	128	28.0	4.39
B-NV22-C-1A	-200 TM	7.9888	µg/g	16.7	130	28.0	4.31
B-NV22-C-1A Average	-200 TM		µg/g	17.3	129	28.0	4.35
Standard Deviation				0.869	1.22	0.011	0.055
Percent RSD				5.0%	0.95%	0.04%	1.3%
B-NV22-C-1A (1)	+30 TM	8.0209	µg/g	159	229	0.972	28.1
B-NV22-C-1A (2)	+30 TM	8.1285	µg/g	32.2	230	4.93	17.0
B-NV22-C-1A (3)	+30 TM	5.7570	µg/g	342	191	3.61	44.4
B-NV22-C-1A Weighted Average	+30 TM		µg/g	160	219	3.13	28.2
B-NV22-C-1B	-200 TM	7.9915	µg/g	17.5	136	30.0	4.56
B-NV22-C-1B	-200 TM	7.9685	µg/g	16.8	131	30.4	4.43
B-NV22-C-1B Average	-200 TM		µg/g	17.2	133	30.2	4.49
Standard Deviation				0.470	3.34	0.292	0.088
Percent RSD				2.7%	2.5%	1.0%	2.0%
B-NV22-C-1B (1)	+30 TM	8.2240	µg/g	48.5	273	12.7	17.0
B-NV22-C-1B (2)	+30 TM	8.0771	µg/g	36.7	1093	132	14.8
B-NV22-C-1B (3)	+30 TM	8.1550	µg/g	31.2	220	9.09	12.4
B-NV22-C-1B (4)	+30 TM	6.0331	µg/g	50372	365	20.1	5539
B-NV22-C-1B Weighted Average	+30 TM		µg/g	9999	495	44.8	1108
B-NV22-M-1A	TCLP	100.2	µg/mL	2.11	73.1	2.58	0.175
B-NV22-M-1A	TCLP	100.2	µg/mL	2.11	73.3	2.50	0.289
B-NV22-M-1A Average	TCLP		µg/mL	2.11	73.2	2.54	0.232
Standard Deviation				0.004	0.141	0.054	0.081
Percent RSD				0.20%	0.19%	2.1%	35%
B-NV22-M-1A	-200 TM	8.4331	µg/g	86.6	1655	207	14.7
B-NV22-M-1A	-200 TM	8.0245	µg/g	101	1672	217	15.9
B-NV22-M-1A Average	-200 TM		µg/g	93.8	1663	212	15.3
Standard Deviation				10.2	12.3	6.70	0.792
Percent RSD				11%	0.74%	3.2%	5.2%
B-NV22-M-1A (1)	+30 TM	8.0816	µg/g	457	1158	86.8	53.6
B-NV22-M-1A (2)	+30 TM	8.0256	µg/g	383	383	23.0	43.4
B-NV22-M-1A (3)	+30 TM	8.0877	µg/g	105	689	41.0	13.7
B-NV22-M-1A (4)	+30 TM	8.0376	µg/g	271	2134	211	33.0
B-NV22-M-1A (5)	+30 TM	5.9463	µg/g	222	257	21.3	25.5
B-NV22-M-1A Weighted Average	+30 TM		µg/g	291	961	79.6	34.3
B-NV22-K-1A	TCLP	101.6	µg/mL	1.05	16.2	0.388	0.186
B-NV22-K-1A	TCLP	101.0	µg/mL	1.09	13.2	0.200	0.187
B-NV22-K-1A	TCLP		µg/mL	1.07	14.7	0.294	0.186
B-NV22-K-1B	TCLP	100.2	µg/mL	0.934	13.1	0.163	0.202
B-NV22-K-1B	TCLP	100.1	µg/mL	0.942	12.9	0.260	0.180
B-NV22-K-1B	TCLP		µg/mL	0.938	13.0	0.212	0.191
B-NV22-K-1 Average	TCLP		µg/mL	1.01	13.9	0.253	0.189
Standard Deviation				0.096	1.17	0.058	0.003
Percent RSD				10%	8.4%	23%	1.7%

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-NV22-K-1A	-200 TM	8.3142	µg/g	35.4	299	44.5	7.03
B-NV22-K-1A	-200 TM	8.2285	µg/g	38.3	308	45.1	7.44
B-NV22-K-1A Average	-200 TM		µg/g	36.8	304	44.8	7.24
Standard Deviation				2.03	5.81	0.431	0.294
Percent RSD				5.5%	1.9%	1.0%	4.1%
B-NV22-K-1A (1)	+30 TM	8.0565	µg/g	67.1	346	10.5	27.1
B-NV22-K-1A (2)	+30 TM	8.1529	µg/g	369	3867	392	49.5
B-NV22-K-1A (3)	+30 TM	6.3253	µg/g	70.6	402	12.8	17.2
B-NV22-K-1A Weighted Average	+30 TM		µg/g	177	1636	149	32.4
B-NV22-K-1B	-200 TM	8.2834	µg/g	40.5	315	47.7	7.84
B-NV22-K-1B	-200 TM	7.9812	µg/g	40.0	315	48.1	7.71
B-NV22-K-1B Average	-200 TM		µg/g	40.3	315	47.9	7.78
Standard Deviation				0.350	0.450	0.319	0.088
Percent RSD				0.87%	0.14%	0.67%	1.1%
B-NV22-K-1B	+30 TM	10.9691	µg/g	62229	10457	191	7038
B-NV23-T-1A	TCLP	100.3	µg/mL	0.010	1.63	0.564	1.48
B-NV23-T-1A	TCLP	100.1	µg/mL	0.010	1.80	0.609	0.050
B-NV23-T-1A	TCLP		µg/mL	0.010	1.71	0.586	0.765
B-NV23-T-1B	TCLP	100.4	µg/mL	0.000	1.87	0.585	0.033
B-NV23-T-1B	TCLP	100.4	µg/mL	0.000	1.71	0.542	0.045
B-NV23-T-1B	TCLP		µg/mL	0.000	1.79	0.564	0.039
B-NV23-T-1 Average	TCLP		µg/mL	0.005	1.75	0.575	0.402
Standard Deviation				0.007	0.051	0.016	0.513
Percent RSD				141%	2.9%	2.8%	128%
B-NV23-T-1D	-200 TM	8.1295	µg/g	68.1	213	104	19.0
B-NV23-T-1D	-200 TM	8.0549	µg/g	69.2	228	106	19.7
B-NV23-T-1D Average	-200 TM		µg/g	68.6	221	105	19.4
Standard Deviation				0.814	10.0	0.876	0.457
Percent RSD				1.2%	4.5%	0.84%	2.4%
B-NV23-T-1D	+30 TM	7.8007	µg/g	771	1005	33.9	103
B-NV23-T-1E	-200 TM	8.3567	µg/g	68.8	234	108	19.4
B-NV23-T-1E	-200 TM	8.0731	µg/g	65.5	229	107	18.8
B-NV23-T-1E Average	-200 TM		µg/g	67.1	231	107	19.1
Standard Deviation				2.30	4.01	0.802	0.465
Percent RSD				3.4%	1.7%	0.75%	2.4%
B-NV23-T-1E	+30 TM	11.5764	µg/g	193	973	31.4	30.1
B-NV25-T-1A	TCLP	100.7	µg/mL	0.000	1.81	1.19	0.047
B-NV25-T-1A	TCLP	101.1	µg/mL	0.000	1.86	1.12	0.055
B-NV25-T-1A	TCLP		µg/mL	0.000	1.83	1.16	0.051
B-NV25-T-1B	TCLP	100.1	µg/mL	0.000	1.78	0.980	0.070
B-NV25-T-1B	TCLP	100.6	µg/mL	0.000	3.16	1.15	0.061
B-NV25-T-1B	TCLP		µg/mL	0.000	2.47	1.06	0.066
B-NV25-T-1 Average	TCLP		µg/mL	0.000	2.15	1.11	0.059
Standard Deviation				0.000	0.450	0.067	0.010
Percent RSD				0%	21%	6.0%	17%
B-NV25-T-1D	-200 TM	8.0820	µg/g	81.5	236	118	24.3

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-NV25-T-1D	-200 TM	7.9417	µg/g	71.8	241	116	21.9
B-NV25-T-1D Average	-200 TM		µg/g	76.7	239	117	23.1
Standard Deviation				6.87	3.39	1.52	1.67
Percent RSD				9.0%	1.4%	1.3%	7.2%
B-NV25-T-1D	+30 TM	10.8637	µg/g	846	421	21.3	107
B-NV25-T-1E	-200 TM	7.9883	µg/g	73.6	237	114	21.5
B-NV25-T-1E	-200 TM	8.2104	µg/g	75.3	221	116	21.7
B-NV25-T-1E Average	-200 TM		µg/g	74.5	229	115	21.6
Standard Deviation				1.19	11.0	1.36	0.169
Percent RSD				1.6%	4.8%	1.2%	0.78%
B-NV25-T-1E	+30 TM	12.0212	µg/g	663	202	20.1	128
B-NV25-U-1A	TCLP	100.5	µg/mL	0.586	32.5	0.092	0.134
B-NV25-U-1A	TCLP	100.5	µg/mL	1.15	49.8	0.118	0.299
B-NV25-U-1A	TCLP		µg/mL	0.866	41.1	0.105	0.217
B-NV25-U-1B	TCLP	100.6	µg/mL	0.690	22.0	0.057	0.293
B-NV25-U-1B	TCLP	100.1	µg/mL	0.735	23.6	0.052	0.258
B-NV25-U-1B	TCLP		µg/mL	0.713	22.8	0.055	0.276
B-NV25-U-1 Average	TCLP		µg/mL	0.790	31.9	0.080	0.246
Standard Deviation				0.109	13.0	0.035	0.042
Percent RSD				14%	41%	44%	17%
B-NV25-U-1D	-200 TM	8.2790	µg/g	164	892	83.4	33.6
B-NV25-U-1D	-200 TM	8.1138	µg/g	104	898	81.0	27.8
B-NV25-U-1D Average	-200 TM		µg/g	134	895	82.2	30.7
Standard Deviation				42.4	4.47	1.73	4.10
Percent RSD				32%	0.5%	2.1%	13%
B-NV25-U-1D (1)	+30 TM	8.0520	µg/g	9686	10681	662	946
B-NV25-U-1D (2)	+30 TM	8.0363	µg/g	5565	19586	885	538
B-NV25-U-1D (3)	+30 TM	7.4530	µg/g	4209	12941	379	429
B-NV25-U-1D Weighted Average	+30 TM		µg/g	6545	14436	649	643
B-NV25-U-1E	-200 TM	8.3223	µg/g	114	870	76.5	28.9
B-NV25-U-1E	-200 TM	8.1568	µg/g	162	866	77.0	33.3
B-NV25-U-1E Average	-200 TM		µg/g	138	868	76.8	31.1
Standard Deviation				34.1	3.46	0.370	3.15
Percent RSD				25%	0.40%	0.48%	10%
B-NV25-U-1E (1)	+30 TM	8.0666	µg/g	2360	13128	597	228
B-NV25-U-1E (2)	+30 TM	6.9691	µg/g	6632	22958	558	655
B-NV25-U-1E Weighted Average	+30 TM		µg/g	4340	17685	579	426
B-NV25-P-1A	TCLP	100.6	µg/mL	50.6	1544	0.016	11.2
B-NV25-P-1A	TCLP	100.7	µg/mL	46.3	1403	0.116	10.1
B-NV25-P-1A	TCLP		µg/mL	48.5	1474	0.066	10.7
Standard Deviation				3.00	99.8	0.071	0.745
Percent RSD				6.2%	6.8%	106%	7.0%
B-NV25-P-1A	-200 TM	8.1744	µg/g	4245	16667	312	688
B-NV25-P-1A	-200 TM	8.2715	µg/g	4275	16019	306	690
B-NV25-P-1A	-200 TM		µg/g	4260	16343	309	689
Standard Deviation				21.2	458	4.13	1.13

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Percent RSD				0.50%	2.8%	1.3%	0.16%
3-NV25-P-1A	+30 TM	0.9130	µg/g	5702	84272	331	752
3-NV26-T-1A	TCLP	101.0	µg/mL	0.000	1.63	0.496	0.034
3-NV26-T-1A	TCLP	100.6	µg/mL	0.000	1.75	0.532	0.072
3-NV26-T-1A	TCLP		µg/mL	0.000	1.69	0.514	0.053
3-NV26-T-1B	TCLP	101.8	µg/mL	0.000	1.73	0.493	0.308
3-NV26-T-1B	TCLP	100.0	µg/mL	0.000	2.78	0.413	0.108
3-NV26-T-1B	TCLP		µg/mL	0.000	2.26	0.453	0.208
3-NV26-T-1 Average	TCLP		µg/mL	0.000	1.97	0.483	0.131
Standard Deviation				0.000	0.401	0.043	0.109
Percent RSD				0%	20%	8.9%	84%
3-NV26-T-1D	-200 TM	8.2082	µg/g	49.9	175	72.8	15.0
3-NV26-T-1D	-200 TM	7.9782	µg/g	51.6	185	74.2	15.3
3-NV26-T-1D Average	-200 TM		µg/g	50.7	180	73.5	15.1
Standard Deviation				1.25	7.06	1.04	0.250
Percent RSD				2.5%	3.9%	1.4%	1.7%
3-NV26-T-1D (1)	+30 TM	7.3180	µg/g	87.1	126	12.9	17.9
3-NV26-T-1D (2)	+30 TM	7.4880	µg/g	78.2	224	19.1	17.8
3-NV26-T-1D Weighted Average	+30 TM		µg/g	82.6	176	16.0	17.8
3-NV26-T-1E	-200 TM	8.2460	µg/g	53.1	183	74.4	14.8
3-NV26-T-1E	-200 TM	7.9828	µg/g	49.6	176	74.3	14.0
3-NV26-T-1E Average	-200 TM		µg/g	51.4	179	74.4	14.4
Standard Deviation				2.48	4.97	0.054	0.600
Percent RSD				4.8%	2.8%	0.07%	4.2%
3-NV26-T-1E	+30 TM	4.5494	µg/g	218	1118	36.3	35.3
3-NV26-U-1A	TCLP	100.3	µg/mL	0.717	18.9	0.158	0.348
3-NV26-U-1A	TCLP	100.7	µg/mL	0.745	21.7	0.102	0.363
3-NV26-U-1A	TCLP		µg/mL	0.731	20.3	0.130	0.355
3-NV26-U-1B	TCLP	100.6	µg/mL	1.09	48.5	0.379	0.341
3-NV26-U-1B	TCLP	100.1	µg/mL	0.865	56.0	0.982	0.466
3-NV26-U-1B	TCLP		µg/mL	0.977	52.2	0.680	0.404
3-NV26-U-1 Average	TCLP		µg/mL	0.854	36.3	0.405	0.379
Standard Deviation				0.173	22.6	0.389	0.034
Percent RSD				20%	62%	96%	9.0%
3-NV26-U-1D	-200 TM	8.7154	µg/g	103	696	62.4	26.6
3-NV26-U-1D	-200 TM	7.8878	µg/g	100	700	63.7	26.2
3-NV26-U-1D Average	-200 TM		µg/g	102	698	63.0	26.4
Standard Deviation				2.04	2.69	0.916	0.284
Percent RSD				2.0%	0.39%	1.5%	1.1%
3-NV26-U-1D	+30 TM	4.5068	µg/g	11421	39096	1610	1108
3-NV26-U-1E	-200 TM	8.1255	µg/g	166	756	63.5	32.2
3-NV26-U-1E	-200 TM	8.0095	µg/g	107	744	62.8	25.9
3-NV26-U-1E Average	-200 TM		µg/g	137	750	63.2	29.1
Standard Deviation				41.2	8.15	0.497	4.42
Percent RSD				30%	1.1%	0.79%	15%
3-NV26-U-1E	+30 TM	3.6833	µg/g	11148	16659	1417	804

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-NV26-Qf-1A			µg/mL	7.52	103	0.434	2.33
B-NV26-Qc-1A			µg/mL	0.656	7.66	0.029	0.105
B-NV27-T-1A	TCLP	100.3	µg/mL	0.277	3.12	0.165	0.208
B-NV27-T-1A	TCLP	100.8	µg/mL	0.167	2.84	0.089	0.205
B-NV27-T-1A	TCLP		µg/mL	0.222	2.98	0.127	0.207
B-NV27-T-1B	TCLP	100.3	µg/mL	0.150	2.66	0.109	0.167
B-NV27-T-1B	TCLP	100.0	µg/mL	0.192	2.72	0.185	0.189
B-NV27-T-1B	TCLP		µg/mL	0.171	2.69	0.147	0.178
B-NV27-T-1 Average	TCLP		µg/mL	0.197	2.84	0.137	0.192
Standard Deviation				0.036	0.207	0.014	0.020
Percent RSD				18%	7.3%	10%	10%
B-NV27-T-1D	-200 TM	8.3954	µg/g	54.2	154	77.5	15.5
B-NV27-T-1D	-200 TM	8.0444	µg/g	66.2	154	75.7	17.5
B-NV27-T-1D Average	-200 TM		µg/g	60.2	154	76.6	16.5
Standard Deviation				8.46	0.333	1.33	1.42
Percent RSD				14%	0.22%	1.7%	8.6%
B-NV27-T-1D	+30 TM	8.6272	µg/g	934	2219	90.1	104
B-NV27-T-1E	-200 TM	8.1552	µg/g	54.3	165	79.6	15.0
B-NV27-T-1E	-200 TM	8.2555	µg/g	53.6	154	74.7	14.5
B-NV27-T-1E	-200 TM	8.0314	µg/g	57.4	161	81.2	15.8
B-NV27-T-1E	-200 TM	8.4359	µg/g	67.8	161	79.4	16.7
B-NV27-T-1E Average	-200 TM		µg/g	58.3	160	78.7	15.5
Standard Deviation				6.56	4.33	2.82	0.940
Percent RSD				11%	2.7%	3.6%	6.1%
B-NV27-T-1E	+30 TM	6.7442	µg/g	777	1360	142	86.7
B-NV29-T-1A	TCLP	100.2	µg/mL	0.432	3.47	0.074	0.127
B-NV29-T-1A	TCLP	100.8	µg/mL	0.462	3.49	0.652	0.164
B-NV29-T-1A	TCLP		µg/mL	0.447	3.48	0.363	0.146
B-NV29-T-1B	TCLP	100.7	µg/mL	0.464	3.41	0.036	0.461
B-NV29-T-1B	TCLP	100.3	µg/mL	0.461	3.37	0.085	0.155
B-NV29-T-1B	TCLP		µg/mL	0.462	3.39	0.060	0.308
B-NV29-T-1 Average	TCLP		µg/mL	0.455	3.44	0.212	0.227
Standard Deviation				0.011	0.064	0.214	0.115
Percent RSD				2.4%	1.9%	101%	51%
B-NV29-T-1D	-200 TM	8.3155	µg/g	76.4	217	126	20.9
B-NV29-T-1D	-200 TM	8.3211	µg/g	77.2	212	126	20.8
B-NV29-T-1D Average	-200 TM		µg/g	76.8	215	126	20.9
Standard Deviation				0.575	3.77	0.297	0.083
Percent RSD				0.75%	1.8%	0.24%	0.40%
B-NV29-T-1D (1)	+30 TM	8.2379	µg/g	2021	916	36.9	216
B-NV29-T-1D (2)	+30 TM	7.6830	µg/g	291	3011	51.7	38.6
B-NV29-T-1D Weighted Average	+30 TM		µg/g	1186	1927	44	130
B-NV29-T-1E	-200 TM	8.3179	µg/g	81.3	230	132	22.3
B-NV29-T-1E	-200 TM	7.9429	µg/g	74.3	214	129	20.5
B-NV29-T-1E Average	-200 TM		µg/g	77.8	222	131	21.4
Standard Deviation				4.98	11.3	2.63	1.23

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Percent RSD				6.4%	5.1%	2.0%	5.7%
B-NV29-T-1E (1)	+30 TM	7.8198	µg/g	106	691	81.6	19.5
B-NV29-T-1E (2)	+30 TM	7.8189	µg/g	911	809	88.8	109
B-NV29-T-1E Weighted Average	+30 TM		µg/g	509	750	85.2	64.1
B-NV30-T-1A	TCLP	100.0	µg/mL	0.375	3.73	0.073	0.424
B-NV30-T-1A	TCLP	100.5	µg/mL	0.379	3.39	0.000	0.177
B-NV30-T-1A	TCLP		µg/mL	0.377	3.56	0.036	0.301
B-NV30-T-1B	TCLP	100.1	µg/mL	0.355	3.64	0.021	0.122
B-NV30-T-1B	TCLP	100.3	µg/mL	0.357	3.35	0.072	0.156
B-NV30-T-1B	TCLP		µg/mL	0.356	3.50	0.047	0.139
B-NV30-T-1 Average	TCLP		µg/mL	0.367	3.53	0.041	0.220
Standard Deviation				0.015	0.045	0.007	0.114
Percent RSD				4.0%	1.3%	17%	52%
B-NV30-T-1D	-200 TM	8.2454	µg/g	58.8	227	94.4	14.6
B-NV30-T-1D	-200 TM	8.0571	µg/g	59.8	227	96.9	14.6
B-NV30-T-1D Average	-200 TM		µg/g	59.3	227	95.6	14.6
Standard Deviation				0.691	0.273	1.81	0.006
Percent RSD				1.2%	0.12%	1.9%	0.04%
B-NV30-T-1D (1)	+30 TM	6.8107	µg/g	1006	1481	129	118
B-NV30-T-1E	-200 TM	8.1941	µg/g	59.3	219	90.8	14.4
B-NV30-T-1E	-200 TM	8.0782	µg/g	57.5	216	91.3	14.2
B-NV30-T-1E Average	-200 TM		µg/g	58.4	218	91.1	14.3
Standard Deviation				1.27	2.10	0.344	0.162
Percent RSD				2.2%	1.0%	0.38%	1.1%
B-NV30-T-1E (1)	+30 TM	7.8052	µg/g	580	1667	151	67.4
B-NV30-T-1E (2)	+30 TM	7.1641	µg/g	130	1671	40.2	24.7
B-NV30-T-1E Weighted Average	+30 TM		µg/g	365	1669	98.0	47.0
B-DC02-T-A	TCLP	100.4	µg/mL	0.131	1.87	0.381	0.015
B-DC02-T-A	TCLP	100.1	µg/mL	0.092	1.72	0.363	0.098
B-DC02-T-1A	TCLP		µg/mL	0.111	1.80	0.372	0.057
B-DC02-T-B	TCLP	100.4	µg/mL	0.103	1.96	0.529	0.028
B-DC02-T-B	TCLP	100.8	µg/mL	0.097	1.86	0.457	0.010
B-DC02-T-1B	TCLP		µg/mL	0.100	1.91	0.493	0.019
B-DC02-T-1 Average	TCLP		µg/mL	0.106	1.85	0.433	0.038
Standard Deviation				0.008	0.083	0.086	0.026
Percent RSD				7.7%	4.5%	20%	70%
B-DC02-T-1D	-200 TM	8.2591	µg/g	46.6	163	64.4	12.5
B-DC02-T-1D	-200 TM	8.0306	µg/g	48.4	163	64.1	13.0
B-DC02-T-1D Average	-200 TM		µg/g	47.5	163	64.2	12.7
Standard Deviation				1.31	0.231	0.237	0.388
Percent RSD				2.8%	0.14%	0.37%	3.0%
B-DC02-T-1D	+30 TM	7.5065	µg/g	672	774	81.7	72.4
B-DC02-T-1E	-200 TM	8.0172	µg/g	49.1	173	65.9	13.2
B-DC02-T-1E	-200 TM	8.1420	µg/g	50.5	175	67.0	13.4
B-DC02-T-1E Average	-200 TM		µg/g	49.8	174	66.5	13.3
Standard Deviation				1.01	1.56	0.779	0.138

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Percent RSD				2.0%	0.90%	1.2%	1.0%
B-DC02-T-1E	+30 TM	8.7437	µg/g	897	2255	101	94.1
B-DC02-L-1A	TCLP	101.6	µg/mL	1.01	9.33	0.108	0.410
B-DC02-L-1A	TCLP	100.0	µg/mL	1.14	10.6	0.139	0.437
B-DC02-L-1A Average	TCLP		µg/mL	1.08	9.98	0.124	0.423
Standard Deviation				0.087	0.914	0.022	0.019
Percent RSD				8.1%	9.2%	18%	4.5%
B-DC02-L-1A	-200 TM	7.9417	µg/g	101	432	156	26.9
B-DC02-L-1A	-200 TM	7.9856	µg/g	98.9	425	153	27.5
B-DC02-L-1A Average	-200 TM		µg/g	99.7	428	155	27.2
Standard Deviation				1.21	5.40	1.69	0.480
Percent RSD				1.2%	1.3%	1.1%	1.8%
B-DC02-L-1A	+30 TM	7.3109	µg/g	125	350	181	41.1
B-DC02-F-1A	TCLP	100.0	µg/mL	0.255	2.77	0.038	0.206
B-DC02-F-1A	TCLP	100.6	µg/mL	0.478	2.80	0.069	0.228
B-DC02-F-1A Average	TCLP		µg/mL	0.367	2.78	0.054	0.217
Standard Deviation				0.158	0.021	0.022	0.015
Percent RSD				43%	0.76%	42%	7.0%
B-DC02-F-1A	-200 TM	8.0165	µg/g	83.4	178	93.9	23.7
B-DC02-F-1A	-200 TM	8.2134	µg/g	81.6	173	94.8	23.2
B-DC02-F-1A Average	-200 TM		µg/g	82.5	175	94.4	23.4
Standard Deviation				1.31	3.78	0.629	0.349
Percent RSD				1.6%	2.2%	0.67%	1.5%
B-DC02-F-1A	+30 TM	1.6436	µg/g	94.8	530	48.9	32.3
B-DC03-FB-1A	TCLP	100.4	µg/mL	0.000	0.000	0.000	0.025
B-DC03-FB-1A	TCLP	100.0	µg/mL	0.000	0.000	0.000	0.037
B-DC03-FB-1A Average	TCLP		µg/mL	0.000	0.000	0.000	0.031
Standard Deviation				0.000	0.000	0.000	0.008
Percent RSD				0%	0%	0%	26%
B-DC03-FB-1A	-200 TM	8.3102	µg/g	6.17	4.67	0.631	6.19
B-DC03-FB-1A	-200 TM	8.0845	µg/g	6.35	5.66	1.28	6.22
B-DC03-FB-1A Average	-200 TM		µg/g	6.26	5.17	0.955	6.21
Standard Deviation				0.129	0.696	0.459	0.019
Percent RSD				2.1%	13%	48%	0.3%
B-DC03-T-1A	TCLP	100.6	µg/mL	0.098	1.35	0.278	0.075
B-DC03-T-1A	TCLP	101.6	µg/mL	0.097	1.53	0.266	0.102
B-DC03-T-1A	TCLP		µg/mL	0.097	1.44	0.272	0.088
B-DC03-T-1B	TCLP	100.2	µg/mL	0.092	1.29	0.364	0.105
B-DC03-T-1B	TCLP	101.1	µg/mL	0.095	1.28	0.314	0.083
B-DC03-T-1B	TCLP		µg/mL	0.093	1.29	0.339	0.094
B-DC03-T-1 Average	TCLP		µg/mL	0.095	1.36	0.306	0.091
Standard Deviation				0.003	0.108	0.047	0.004
Percent RSD				3.0%	7.9%	16%	4.6%
B-DC03-T-1D	-200 TM	8.3053	µg/g	46.6	133	70.7	14.8
B-DC03-T-1D	-200 TM	8.2276	µg/g	52.3	136	70.4	15.1
B-DC03-T-1D Average	-200 TM		µg/g	49.5	135	70.5	14.9

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Standard Deviation				3.99	1.96	0.250	0.265
Percent RSD				8.1%	1.5%	0.35%	1.8%
B-DC03-T-1D	+30 TM	8.6226	µg/g	371	177	17.2	45.2
B-DC03-T-1E	-200 TM	7.9404	µg/g	41.6	126	68.5	11.5
B-DC03-T-1E	-200 TM	8.4434	µg/g	45.0	125	66.4	14.3
B-DC03-T-1E Average	-200 TM		µg/g	43.3	126	67.4	12.9
Standard Deviation				2.35	0.445	1.49	2.01
Percent RSD				5.4%	0.35%	2.2%	16%
B-DC03-T-1E	+30 TM	10.4566	µg/g	278	392	20.0	34.1
B-DC03-U-1A	TCLP	100.3	µg/mL	0.856	109	3.00	0.300
B-DC03-U-1A	TCLP	100.1	µg/mL	0.607	11.9	0.142	0.612
B-DC03-U-1A	TCLP		µg/mL	0.732	60.2	1.57	0.456
B-DC03-U-1B	TCLP	100.5	µg/mL	0.621	20.8	0.182	0.278
B-DC03-U-1B	TCLP	101.3	µg/mL	0.618	20.2	0.300	0.247
B-DC03-U-1B	TCLP		µg/mL	0.619	20.5	0.241	0.263
B-DC03-U-1 Average	TCLP		µg/mL	0.676	40.4	0.906	0.359
Standard Deviation				0.079	28.1	0.940	0.137
Percent RSD				12%	70%	104%	38%
B-DC03-U-1D	-200 TM	7.9536	µg/g	80.7	497	47.7	21.1
B-DC03-U-1D	-200 TM	7.9180	µg/g	76.2	496	47.7	20.0
B-DC03-U-1D Average	-200 TM		µg/g	78.4	496	47.7	20.5
Standard Deviation				3.19	0.743	0.009	0.785
Percent RSD				4.1%	0.15%	0.02%	3.8%
B-DC03-U-1D	+30 TM	2.2020	µg/g	28851	39968	2103	2734
B-DC03-U-1E	-200 TM	8.3474	µg/g	77.7	557	51.7	20.6
B-DC03-U-1E	-200 TM	8.2228	µg/g	84.7	557	54.3	21.1
B-DC03-U-1E Average	-200 TM		µg/g	81.2	557	53.0	20.8
Standard Deviation				4.96	0.288	1.84	0.386
Percent RSD				6.1%	0.05%	3.5%	1.8%
B-DC03-U-1E	+30 TM	0.3124	µg/g	51248	332266	24203	5090
B-DC03-FB-1A (1)	+30 TM	8.1573	µg/g	0.841	185	18.6	10.1
B-DC03-FB-1A (2)	+30 TM	8.0174	µg/g	0.556	2.68	0.030	10.2
B-DC03-FB-1A (3)	+30 TM	3.7920	µg/g	0.000	268	28.9	9.61
B-DC03-FB-1A Weighted Average	+30 TM		µg/g	0.567	128	13.1	10.0
B-DC04-T-1A	TCLP	100.9	µg/mL	0.725	4.39	0.149	0.234
B-DC04-T-1A	TCLP	100.1	µg/mL	0.215	1.73	0.111	0.136
B-DC04-T-1A	TCLP		µg/mL	0.470	3.06	0.130	0.185
B-DC04-T-1B	TCLP	100.3	µg/mL	0.183	1.69	0.180	0.123
B-DC04-T-1B	TCLP	101.3	µg/mL	0.195	1.60	0.149	0.132
B-DC04-T-1B	TCLP		µg/mL	0.189	1.64	0.165	0.127
B-DC04-T-1 Average	TCLP		µg/mL	0.330	2.35	0.147	0.156
Standard Deviation				0.199	1.00	0.024	0.040
Percent RSD				60%	43%	17%	26%
B-DC04-T-1D	-200 TM	8.2388	µg/g	40.9	113	66.1	13.6
B-DC04-T-1D	-200 TM	8.1853	µg/g	41.5	107	66.5	13.4
B-DC04-T-1D Average	-200 TM		µg/g	41.2	110	66.3	13.5

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Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Standard Deviation				0.431	4.33	0.288	0.175
Percent RSD				1.0%	3.9%	0.43%	1.3%
B-DC04-T-1D	+30 TM	3.1694	µg/g	331	392	20.9	46.0
B-DC04-T-1E	-200 TM	8.1561	µg/g	41.9	109	64.4	13.7
B-DC04-T-1E	-200 TM	8.2638	µg/g	46.9	121	63.5	15.1
B-DC04-T-1E Average	-200 TM		µg/g	44.4	115	64.0	14.4
Standard Deviation				3.53	8.57	0.70	1.00
Percent RSD				8.0%	7.5%	1.1%	6.9%
B-DC04-T-1E	+30 TM	2.9952	µg/g	7409	80.8	13.5	815
B-DC04-U-1A	TCLP	100.1	µg/mL	0.542	12.6	0.036	0.214
B-DC04-U-1A	TCLP	100.4	µg/mL	0.562	8.03	0.338	0.235
B-DC04-U-1A	TCLP		µg/mL	0.552	10.3	0.187	0.225
B-DC04-U-1B	TCLP	101.2	µg/mL	5.75	13.7	0.004	0.397
B-DC04-U-1B	TCLP	100.2	µg/mL	1.21	20.6	0.250	0.255
B-DC04-U-1B	TCLP		µg/mL	3.48	17.2	0.127	0.326
B-DC04-U-1 Average	TCLP		µg/mL	2.02	13.7	0.157	0.275
Standard Deviation				2.07	4.85	0.043	0.072
Percent RSD				103%	35%	27%	26%
B-DC04-U-1D	-200 TM	8.0541	µg/g	104	494	52.2	27.4
B-DC04-U-1D	-200 TM	8.4252	µg/g	88.1	484	52.4	25.2
B-DC04-U-1D Average	-200 TM		µg/g	96.2	489	52.3	26.3
Standard Deviation				11.5	7.16	0.154	1.52
Percent RSD				12%	1.5%	0.30%	5.8%
B-DC04-U-1D	+30 TM	4.7640	µg/g	15065	29681	1374	1453
B-DC04-U-1E	-200 TM	7.9537	µg/g	97.1	470	51.4	23.6
B-DC04-U-1E	-200 TM	8.3582	µg/g	83.9	503	55.2	22.6
B-DC04-U-1E Average	-200 TM		µg/g	90.5	487	53.3	23.1
Standard Deviation				9.35	23.3	2.62	0.721
Percent RSD				10%	4.8%	4.9%	3.1%
B-DC04-U-1E	+30 TM	5.3882	µg/g	13431	15430	898	1242
B-DC05-T-1A	TCLP	100.3	µg/mL	0.114	1.48	0.216	0.077
B-DC05-T-1A	TCLP	101.6	µg/mL	0.096	1.24	0.186	0.079
B-DC05-T-1A	TCLP		µg/mL	0.105	1.36	0.201	0.078
B-DC05-T-1B	TCLP	101.0	µg/mL	0.139	7.54	0.406	0.372
B-DC05-T-1B	TCLP	100.9	µg/mL	0.122	1.96	0.218	0.114
B-DC05-T-1B	TCLP		µg/mL	0.131	4.75	0.312	0.243
B-DC05-T-1 Average	TCLP		µg/mL	0.118	3.06	0.256	0.161
Standard Deviation				0.018	2.40	0.079	0.117
Percent RSD				15%	78%	31%	73%
B-DC05-T-1D	-200 TM	8.2168	µg/g	47.4	129	76.5	15.7
B-DC05-T-1D	-200 TM	8.3353	µg/g	56.8	128	77.4	16.8
B-DC05-T-1D Average	-200 TM		µg/g	52.1	129	76.9	16.2
Standard Deviation				6.67	0.415	0.657	0.787
Percent RSD				13%	0.32%	0.85%	4.8%
B-DC05-T-1D	+30 TM	2.3005	µg/g	6842	131	11.1	802
B-DC05-T-1E	-200 TM	8.1989	µg/g	49.9	122	77.3	14.2

Fort Polk Demonstration Project
Data Summary

5/13/97
1:30 PM

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-DC05-T-1E	-200 TM	8.1702	µg/g	46.5	128	79.7	14.6
B-DC05-T-1E Average	-200 TM		µg/g	48.2	125	78.5	14.4
Standard Deviation				2.37	4.66	1.70	0.250
Percent RSD				4.9%	3.7%	2.2%	1.7%
B-DC05-T-1E	+30 TM	8.8955	µg/g	582	96.3	13.9	70.1
B-DC05-K-1A	TCLP	100.2	µg/mL	1.97	97.0	1.46	0.330
B-DC05-K-1A	TCLP	101.5	µg/mL	4.63	52.4	1.21	0.489
B-DC05-K-1A	TCLP		µg/mL	3.30	74.7	1.34	0.410
B-DC05-K-1B	TCLP	100.0	µg/mL	1.11	57.7	0.985	0.162
B-DC05-K-1B	TCLP	100.5	µg/mL	0.999	50.7	0.969	0.189
B-DC05-K-1B	TCLP		µg/mL	1.06	54.2	0.977	0.175
B-DC05-K-1 Average	TCLP		µg/mL	2.18	64.5	1.16	0.292
Standard Deviation				1.59	14.5	0.255	0.166
Percent RSD				73%	23%	22%	57%
B-DC05-K-1A	-200 TM	7.9619	µg/g	48.4	978	83.9	8.80
B-DC05-K-1A	-200 TM	7.9903	µg/g	39.3	977	83.1	9.68
B-DC05-K-1A	-200 TM	8.0577	µg/g	57.6	965	82.4	9.60
B-DC05-K-1A	-200 TM	8.3371	µg/g	34.8	976	88.6	7.33
B-DC05-K-1A Average	-200 TM		µg/g	45.0	974	84.5	8.85
Standard Deviation				10.1	6.16	2.78	1.09
Percent RSD				22%	0.63%	3.3%	12%
B-DC05-K-1A (1)	+30 TM	6.0906	µg/g	60011	19194	1164	7889
B-DC05-K-1A (2)	+30 TM	6.2862	µg/g	15405	24466	2191	1613
B-DC05-K-1A Weighted Average	+30 TM		µg/g	37355	21872	1685	4702
B-DC05-K-1B	-200 TM	8.2309	µg/g	53.9	1028	89.9	8.45
B-DC05-K-1B	-200 TM	8.0023	µg/g	56.1	1022	88.3	8.80
B-DC05-K-1B Average	-200 TM		µg/g	55.0	1025	89.1	8.62
Standard Deviation				1.58	4.16	1.13	0.250
Percent RSD				2.9%	0.41%	1.3%	2.9%
B-DC05-K-1B	+30 TM	9.8202	µg/g	18309	16710	1866	2090
B-DC05-C-1A	TCLP	100.1	µg/mL	0.406	10.0	0.063	0.163
B-DC05-C-1A	TCLP	100.5	µg/mL	0.378	8.31	0.042	0.379
B-DC05-C-1A	TCLP		µg/mL	0.392	9.17	0.053	0.271
B-DC05-C-1B	TCLP	101.9	µg/mL	4.33	146	0.044	1.05
B-DC05-C-1B	TCLP	100.5	µg/mL	0.564	12.3	0.018	0.169
B-DC05-C-1B	TCLP		µg/mL	2.45	79.3	0.031	0.612
B-DC05-C-1 Average	TCLP		µg/mL	1.42	44.2	0.042	0.441
Standard Deviation				1.45	49.6	0.015	0.241
Percent RSD				102%	112%	37%	55%
B-DC05-C-1A	-200 TM	8.3496	µg/g	31.1	192	30.4	6.18
B-DC05-C-1A	-200 TM	8.1259	µg/g	32.8	185	31.0	3.95
B-DC05-C-1A Average	-200 TM		µg/g	32.0	189	30.7	5.06
Standard Deviation				1.25	5.32	0.401	1.57
Percent RSD				3.9%	2.8%	1.3%	31%
B-DC05-C-1A (1)	+30 TM	8.1231	µg/g	37.7	367	24.2	18.6
B-DC05-C-1A (2)	+30 TM	8.1425	µg/g	10532	3897	127	972

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-DC05-C-1A (3)	+30 TM	2.7035	µg/g	252	10708	507	26.9
B-DC05-C-1A Weighted Average	+30 TM		µg/g	4573	3356	137	429
B-DC05-C-1B	-200 TM	8.1425	µg/g	21.0	184	31.0	2.86
B-DC05-C-1B	-200 TM	8.0211	µg/g	18.1	186	31.3	2.36
B-DC05-C-1B Average	-200 TM		µg/g	19.6	185	31.2	2.61
Standard Deviation				2.02	0.862	0.174	0.352
Percent RSD				10%	0.47%	0.56%	13%
B-DC05-C-1B (1)	+30 TM	8.0629	µg/g	20290	1463	167	2409
B-DC05-C-1B (2)	+30 TM	5.4902	µg/g	5579	2184	201	553
B-DC05-C-1B Weighted Average	+30 TM		µg/g	14331	1755	180	1657
B-DC05-Z-1A	TCLP	100.0	µg/mL	3.00	7.82	0.102	0.945
B-DC05-Z-1A	TCLP	100.0	µg/mL	2.99	7.86	0.103	0.943
B-DC05-Z-1A Average	TCLP		µg/mL	2.99	7.84	0.103	0.944
Standard Deviation				0.008	0.028	0.001	0.001
Percent RSD				0.28%	0.36%	0.69%	0.10%
B-DC05-Z-1B	-200 TM	2.0150	µg/g	2127	11231	45.6	193
B-DC05-Z-1B	-200 TM	2.0589	µg/g	1946	10374	42.7	173
B-DC05-Z-1B	-200 TM	2.0004	µg/g	2115	10738	43.9	199
B-DC05-Z-1B	-200 TM	2.0016	µg/g	2175	11351	45.1	194
B-DC05-Z-1A Average	-200 TM		µg/g	2091	10924	44.3	190
Standard Deviation				100	452	1.34	11.4
Percent RSD				4.8%	4.1%	3.0%	6.0%
B-DC05-Z-AB	+30 TM	0.7394	µg/g	851	5921	18.2	114
B-DC06-T-1A	TCLP	100.3	µg/mL	0.074	0.848	0.517	0.035
B-DC06-T-1A	TCLP	100.2	µg/mL	0.060	0.712	0.555	0.296
B-DC06-T-1A	TCLP		µg/mL	0.067	0.780	0.536	0.165
B-DC06-T-1B	TCLP	101.7	µg/mL	0.053	0.728	0.608	0.074
B-DC06-T-1B	TCLP	100.4	µg/mL	0.057	0.739	0.522	0.072
B-DC06-T-1B	TCLP		µg/mL	0.055	0.734	0.565	0.073
B-DC06-T-1 Average	TCLP		µg/mL	0.061	0.757	0.551	0.119
Standard Deviation				0.009	0.033	0.021	0.065
Percent RSD				14%	4.3%	3.8%	55%
B-DC06-T-1D	-200 TM	8.4658	µg/g	47.9	116	85.2	16.3
B-DC06-T-1D	-200 TM	8.2410	µg/g	48.6	123	90.4	16.5
B-DC06-T-1D Average	-200 TM		µg/g	48.3	119	87.8	16.4
Standard Deviation				0.529	5.11	3.62	0.158
Percent RSD				1.1%	4.3%	4.1%	1.0%
B-DC06-T-1D	+30 TM	1.5530	µg/g	570	1713	39.0	70.6
B-DC06-T-1E	-200 TM	8.1785	µg/g	51.1	123	90.0	16.7
B-DC06-T-1E	-200 TM	8.2328	µg/g	51.2	119	89.3	17.1
B-DC06-T-1E Average	-200 TM		µg/g	51.2	121	89.6	16.9
Standard Deviation				0.088	2.89	0.557	0.307
Percent RSD				0.17%	2.4%	0.62%	1.8%
B-DC06-T-1E	+30 TM	5.9177	µg/g	149	981	156	24.0
B-DC06-Qf-1A			µg/mL	7.36	88.2	0.347	1.36
B-DC06-Qc-1A			µg/mL	1.15	15.3	0.024	0.411

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-DC06-L-1A	TCLP	100.5	µg/mL	1.26	10.4	0.191	0.822
B-DC06-L-1A	TCLP	100.7	µg/mL	1.21	13.4	0.288	0.490
B-DC06-L-1A Average	TCLP		µg/mL	1.24	11.9	0.240	0.656
Standard Deviation				0.035	2.15	0.069	0.235
Percent RSD				2.8%	18%	29%	36%
B-DC06-L-1A	-200 TM	8.0754	µg/g	107	410	149	29.1
B-DC06-L-1A	-200 TM	8.0448	µg/g	105	399	151	29.1
B-DC06-L-1A Average	-200 TM		µg/g	106	405	150	29.1
Standard Deviation				1.14	7.86	1.21	0.045
Percent RSD				1.1%	1.9%	0.81%	0.15%
B-DC06-L-1A	+30 TM	5.8082	µg/g	148	442	197	42.6
B-DC06-P-1A	TCLP	100.0	µg/mL	59.9	2246	0.000	16.5
B-DC06-P-1A	TCLP	101.1	µg/mL	59.0	2224	0.000	16.6
B-DC06-P-1A Average	TCLP		µg/mL	59.5	2235	0.000	16.6
Standard Deviation				0.622	15.6	0.000	0.042
Percent RSD				1.0%	0.70%	0%	0.26%
B-DC06-P-1A	-200 TM	8.0021	µg/g	8656	22544	477	1298
B-DC06-P-1A	-200 TM	8.3300	µg/g	8819	20804	473	1587
B-DC06-P-1A Average	-200 TM		µg/g	8738	21674	475	1443
Standard Deviation				115	1230	2.57	204
Percent RSD				1.3%	5.7%	0.54%	14%
B-DC06-P-1A	+30 TM	10.7377	µg/g	13755	15916	646	2499
B-DC06-F-1A	TCLP	100.6	µg/mL	0.206	1.96	0.234	0.147
B-DC06-F-1A	TCLP	100.4	µg/mL	0.200	1.94	0.206	0.128
B-DC06-F-1A Average	TCLP		µg/mL	0.203	1.95	0.220	0.138
Standard Deviation				0.005	0.013	0.020	0.014
Percent RSD				2.4%	0.66%	8.9%	9.9%
B-DC06-F-1A	-200 TM	8.0266	µg/g	118	146	105	26.6
B-DC06-F-1A	-200 TM	8.3384	µg/g	59	155	105	14.8
B-DC06-F-1A Average	-200 TM		µg/g	88.5	150	105	20.7
Standard Deviation				42.0	6.65	0.107	8.39
Percent RSD				47%	4.4%	0.10%	41%
B-DC12-T-1A	TCLP	101.4	µg/mL	0.170	2.80	0.642	0.000
B-DC12-T-1A	TCLP	100.7	µg/mL	0.155	2.59	0.621	0.000
B-DC12-T-1A	TCLP		µg/mL	0.162	2.70	0.631	0.000
B-DC12-T-1B	TCLP	101.7	µg/mL	0.177	2.94	0.692	0.580
B-DC12-T-1B	TCLP	100.7	µg/mL	0.164	2.35	0.692	0.000
B-DC12-T-1B	TCLP		µg/mL	0.171	2.64	0.692	0.290
B-DC12-T-1 Average	TCLP		µg/mL	0.166	2.67	0.662	0.145
Standard Deviation				0.006	0.036	0.043	0.205
Percent RSD				3.6%	1.4%	6.5%	141%
B-DC12-T-1D	-200 TM	8.5793	µg/g	94.4	623	74.7	24.9
B-DC12-T-1D	-200 TM	7.8631	µg/g	89.0	614	77.3	23.5
B-DC12-T-1D	-200 TM		µg/g	91.7	619	76.0	24.2
Standard Deviation				3.79	6.79	1.84	1.01
Percent RSD				4.1%	1.1%	2.4%	4.2%

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
B-DC12-T-1D	+30 TM	2.5344	µg/g	24858	40325	2251	2362
B-DC12-T-1E	-200 TM	8.1934	µg/g	88.5	543	74.9	22.7
B-DC12-T-1E	-200 TM	8.1688	µg/g	83.8	539	74.8	21.5
B-DC12-T-1E	-200 TM		µg/g	86.1	541	74.9	22.1
Standard Deviation				3.33	2.48	0.07	0.83
Percent RSD				3.9%	0.46%	0.09%	3.7%
B-DC12-T-1E	+30 TM	5.1693	µg/g	6028	32616	1127	567
B-Wz-A1	TCLP	101.2	µg/mL	0.000	0.000	0.015	0.297
B-Wz-A1	TCLP	100.6	µg/mL	0.000	0.000	0.000	0.173
B-Wz-A1 Average	TCLP		µg/mL	0.000	0.000	0.007	0.235
B-Wz-A2	TCLP	100.5	µg/mL	0.000	0.001	0.000	0.958
B-Wz-A2	TCLP	100.6	µg/mL	0.000	0.000	0.000	1.42
B-Wz-A2 Average	TCLP		µg/mL	0.000	0.001	0.000	1.191
B-Wz-A3	TCLP	100.0	µg/mL	0.000	0.000	0.000	0.206
B-Wz-A3	TCLP	100.6	µg/mL	0.000	0.000	0.000	0.242
B-Wz-A3 Average	TCLP		µg/mL	0.000	0.000	0.000	0.224
B-Wz-A Average	TCLP		µg/mL	0.000	0.000	0.002	0.550
Standard Deviation				0.000	0.000	0.004	0.555
Percent RSD				0.0%	173%	173%	101%
B-WZ-A1	-200 TM	8.3355	µg/g	13.3	9.76	1.80	119
B-WZ-A1	-200 TM	8.3774	µg/g	12.4	10.2	1.16	122
B-WZ-A2 Average	-200 TM		µg/g	12.8	10.0	1.48	121
Standard Deviation				0.678	0.328	0.454	2.01
Percent RSD				5.3%	3.3%	31%	1.7%
B-WZ-A1	+8 TM	8.1279	µg/g	1.23	0.364	0.000	28.3
B-WZ-A2	-200 TM	8.2898	µg/g	19.6	40.0	0.789	139
B-WZ-A2	-200 TM	8.0864	µg/g	16.6	39.0	1.37	141
B-WZ-A2 Average	-200 TM		µg/g	18.1	39.5	1.08	140
Standard Deviation				2.07	0.723	0.409	1.58
Percent RSD				11%	1.8%	38%	1.1%
B-WZ-A2	+30 TM	8.4909	µg/g	1.51	3.63	0.000	33.5
B-WZ-A3	-200 TM	8.0511	µg/g	32.0	23.3	0.676	129
B-WZ-A3	-200 TM	8.3222	µg/g	25.8	19.1	0.601	111
B-WZ-A3	-200 TM	8.2655	µg/g	24.9	17.5	0.854	114
B-WZ-A3	-200 TM	8.0966	µg/g	26.1	18.5	0.865	114
B-WZ-A3 Average	-200 TM		µg/g	27.2	19.6	0.749	117
Standard Deviation				3.23	2.57	0.131	8.43
Percent RSD				12%	13%	18%	7.2%
B-WZ-A3	+30 TM	8.4521	µg/g	3.48	3.26	0.114	49.0

Fort Polk Demonstration Project
Data Summary

5/13/97
1:30 PM

Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
3-DC12-T-1E	-200 TM	8.1934	µg/g	88.5	543	74.9	22.7
3-DC12-T-1E	-200 TM	8.1688	µg/g	83.8	539	74.8	21.5
3-DC12-T-1E	-200 TM		µg/g	86.1	541	74.9	22.1
Standard Deviation				3.33	2.48	0.07	0.83
Percent RSD				3.9%	0.46%	0.09%	3.7%
Relative Percent Difference				5.5%	0.65%	0.12%	5.3%

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Sample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.012	0.095	0.021	0.006
Check Standard			µg/mL	4.97	24.8	2.01	4.98
Percent Recovery				99%	99%	101%	100%
Calibration Verification Standard			µg/mL	2.56	12.6	0.99	2.57
Percent Recovery				102%	101%	99%	103%
Quantitation Limit Standard 1			µg/mL	1.00	4.81	0.408	1.03
Percent Recovery				100%	96%	102%	103%
Quantitation Limit Standard 2			µg/mL	0.492	2.29	0.204	0.532
Percent Recovery				98%	92%	102%	106%
Blank			µg/mL	0.005	0.000	0.010	0.003
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.015	0.032
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.019	0.006
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.002	0.006
B-NV15-T-1A	TCLP	100.2	µg/mL	0.164	0.935	0.079	0.161
B-NV15-T-1A	TCLP	100.0	µg/mL	0.133	1.95	0.134	0.099
B-NV15-T-1A Pre Spike	TCLP	100.0	µg/mL	1.01	5.95	0.118	0.532
Percent Recovery				93%	110%	157%	90%
B-NV15-T-1A Pre Spike	TCLP	100.0	µg/mL	1.07	5.78	0.096	0.531
Percent Recovery				101%	96%	57%	96%
B-NV15-T-1B	TCLP	100.3	µg/mL	0.159	0.805	0.072	0.140
B-NV15-T-1B	TCLP	100.5	µg/mL	0.117	0.715	0.062	0.134
B-NV16-T-1A	TCLP	101.2	µg/mL	0.145	2.99	0.424	0.176
B-NV16-T-1A	TCLP	101.0	µg/mL	0.163	1.87	0.360	0.167
B-NV16-T-1B	TCLP	100.8	µg/mL	0.176	1.31	0.342	0.171
B-NV16-T-1B	TCLP	100.3	µg/mL	0.170	1.13	0.350	0.148
B-NV15-Z-1A	TCLP	100.7	µg/mL	1.73	6.74	0.038	1.42
B-NV15-Z-1A	TCLP	100.7	µg/mL	1.72	6.76	0.033	1.37
B-NV15-T-1A Post Spike	TCLP	100.2	µg/mL	1.11	5.20	1.11	1.06
Percent Recovery				103%	95%	108%	98%
Spiking Solution			µg/mL	10.06	49.7	9.93	10.10
Percent Recovery				101%	99%	99%	101%
Check Standard			µg/mL	5.05	25.0	2.01	5.05
Percent Recovery				101%	100%	101%	101%
Blank			µg/mL	0.011	0.000	0.002	0.004

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.019	0.035	0.032	0.001
Check Standard			µg/mL	5.05	25.1	1.99	5.04
Precent Recovery				101%	101%	100%	101%
Calibration Verification Standard			µg/mL	2.49	12.4	0.992	2.50
Precent Recovery				100%	100%	99%	100%
Quantitation Limit Standard 1			µg/mL	1.03	5.19	0.420	1.05
Precent Recovery				103%	104%	105%	105%
Quantitation Limit Standard 2			µg/mL	0.494	2.54	0.228	0.525
Precent Recovery				99%	101%	114%	105%
Blank			µg/mL	0.141	0.116	0.003	0.011
Method Blank (1)	TCLP		µg/mL	0.059	0.000	0.004	0.006
Method Blank (2)	TCLP		µg/mL	0.016	0.000	0.000	0.003
Method Blank (3)	TCLP		µg/mL	0.009	0.000	0.000	0.003
B-NV14-FB-1A	TCLP	100.3	µg/mL	0.055	0.000	0.000	0.892
B-NV14-FB-1A	TCLP	100.1	µg/mL	0.041	0.000	0.003	0.035
B-NV14-FB-1A Pre Spike	TCLP	100.1	µg/mL	1.04	4.98	0.047	0.512
Precent Recovery				102%	100%	90%	99%
B-NV14-FB-1A Pre Spike	TCLP	100.1	µg/mL	1.01	4.99	0.048	0.558
Precent Recovery				99%	100%	93%	108%
B-NV14-FB-1A Post Spike	TCLP	100.3	µg/mL	0.967	4.34	0.942	1.34
Precent Recovery				94%	87%	94%	94%
Spiking Solution			µg/mL	10.2	50.8	10.1	10.2
Precent Recovery				102%	102%	101%	102%
Check Standard			µg/mL	5.15	25.6	2.02	5.11
Precent Recovery				103%	102%	101%	102%
Blank			µg/mL	0.166	0.088	0.000	0.019
Method Blank (1)	SOIL		µg/mL	0.591	0.165	0.006	0.034
Method Blank (2)	SOIL		µg/mL	0.579	0.065	0.000	0.033
Method Blank (3)	SOIL		µg/mL	0.484	0.010	0.000	0.030
B-NV15-T-1D	-200 TM	8.4290	µg/g	51.30	121.9	53.89	17.76
B-NV15-T-1D	-200 TM	7.8500	µg/g	50.81	204.8	58.70	17.80
B-NV15-T-1D Pre Spike	-200 TM	8.2452	µg/mL	12.0	25.1	7.76	3.05
Precent Recovery				97%	94%	83%	99%
B-NV15-T-1D Pre Spike	-200 TM	8.1347	µg/mL	11.9	25.5	8.01	3.01
Precent Recovery				97%	98%	91%	98%
B-NV15-T-1D	+30 TM	1.6408	µg/g	0.000	22.4	2.80	5.48
B-NV15-T-1E	-200 TM	8.3111	µg/g	49.8	125	56.4	17.7
B-NV15-T-1E	-200 TM	8.0954	µg/g	48.3	122	55.7	17.3
B-NV15-T-1E	+30 TM	1.0022	µg/g	0.000	53.3	8.46	9.29
B-NV15-T-1D Post Spike	-200 TM	8.4290	µg/mL	2.93	9.11	3.17	1.59
Precent Recovery				76%	79%	90%	84%
Spiking Solution			µg/mL	10.2	51.3	10.1	10.3
Precent Recovery				102%	103%	101%	103%
Check Standard			µg/mL	5.14	25.7	2.03	5.13
Precent Recovery				103%	103%	101%	103%
Blank			µg/mL	0.089	0.097	0.000	0.020

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL	0.004	0.063	0.052	0.001
Check Standard			µg/mL	5.01	25.1	2.01	5.02
Precent Recovery				100%	100%	100%	100%
Calibration Verification Standard			µg/mL	2.67	13.4	1.05	2.68
Precent Recovery				107%	107%	105%	107%
Quantitation Limit Standard 1			µg/mL	1.01	5.13	0.426	1.04
Precent Recovery				101%	103%	107%	104%
Quantitation Limit Standard 2			µg/mL	0.499	2.61	0.186	0.536
Precent Recovery				100%	104%	93%	107%
Blank			µg/mL	0.070	0.092	0.000	0.008
Method Blank (1)	SOIL		µg/mL	0.408	0.185	0.000	0.026
Method Blank (2)	SOIL		µg/mL	0.266	0.019	0.005	0.020
Method Blank (3)	SOIL		µg/mL	0.219	0.000	0.000	0.024
B-NV16-T-1D	-200 TM	8.3409	µg/g	48.0	172	63.5	14.3
B-NV16-T-1D	-200 TM	8.1910	µg/g	48.2	177	66.8	14.4
B-NV16-T-1D Pre Spike	-200 TM	8.2673	µg/mL	12.6	29.1	8.60	2.91
Precent Recovery				108%	93%	84%	108%
B-NV16-T-1D Pre Spike	-200 TM	8.0862	µg/mL	11.9	30.2	8.85	2.83
Precent Recovery				101%	102%	93%	105%
B-NV16-T-1D	+30 TM	8.4595	µg/g	411	924	139	48.2
B-NV16-T-1E	-200 TM	8.2743	µg/g	46.0	166	63.8	14.0
B-NV16-T-1E	-200 TM	8.0078	µg/g	45.4	164	64.0	14.0
B-NV16-T-1E	+30 TM	10.8709	µg/g	224	2000	2.70	15.5
B-NV16-T-1D Post Spike	-200 TM	8.3409	µg/mL	2.80	11.3	3.59	1.40
Precent Recovery				80%	83%	94%	80%
Spiking Solution			µg/mL	10.3	51.4	10.2	10.4
Precent Recovery				103%	103%	102%	104%
Check Standard			µg/mL	5.09	25.9	1.88	5.14
Precent Recovery				102%	103%	94%	103%
Blank			µg/mL	0.039	0.149	0.000	0.020

ample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL	0.005	0.016	0.026	0.002
heck Standard			µg/mL	5.36	26.3	2.16	5.29
recent Recovery				107%	105%	108%	106%
alibration Verification Standard			µg/mL	2.56	12.7	1.04	2.55
recent Recovery				102%	102%	104%	102%
uantitation Limit Standard 1			µg/mL	1.04	5.07	0.404	1.03
recent Recovery				104%	101%	101%	103%
uantitation Limit Standard 2			µg/mL	0.522	2.52	0.206	0.523
recent Recovery				104%	101%	103%	105%
lank			µg/mL	0.077	0.201	0.002	0.010
lethod Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.003
lethod Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.001
lethod Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.001
-NV20-T-1A	TCLP	100.6	µg/mL	0.088	1.00	0.349	0.110
-NV20-T-1A	TCLP	100.5	µg/mL	0.065	0.837	0.357	0.081
-NV20-T-1B	TCLP	100.1	µg/mL	0.070	0.895	0.350	0.055
-NV20-T-1B	TCLP	100.3	µg/mL	0.096	1.10	0.305	0.101
-NV21-T-1A	TCLP	100.2	µg/mL	0.147	1.34	0.517	0.226
-NV21-T-1A	TCLP	101.6	µg/mL	0.154	1.26	0.453	0.521
-NV21-T-1B	TCLP	100.0	µg/mL	0.161	1.42	0.481	0.416
-NV21-T-1B	TCLP	100.1	µg/mL	0.159	1.26	0.487	0.576
-NV21-T-1B Pre Spike	TCLP	100.1	µg/mL	1.13	5.90	0.295	0.839
recent Recovery				105%	105%	103%	110%
-NV21-T-1B Pre Spike	TCLP	100.1	µg/mL	1.11	5.56	0.309	0.823
recent Recovery				103%	99%	131%	107%
-NV20-T-1A-1 Post Spike	TCLP	100.6	µg/mL	1.04	5.13	1.18	1.07
recent Recovery				100%	94%	102%	102%
piking Solution			µg/mL	10.3	50.7	10.0	10.4
recent Recovery				103%	101%	100%	104%
heck Standard			µg/mL	5.16	25.6	2.04	5.12
recent Recovery				103%	102%	102%	102%
lank			µg/mL	0.060	0.138	0.000	0.018
lethod Blank (1)	SOIL		µg/mL	0.173	0.097	0.000	0.032
lethod Blank (2)	SOIL		µg/mL	0.120	0.014	0.008	0.030
lethod Blank (3)	SOIL		µg/mL	0.080	0.000	0.000	0.023
-NV14-FB-1A	-200 TM	8.4321	µg/g	8.29	0.254	0.007	7.13
-NV14-FB-1A	-200 TM	8.0899	µg/g	9.87	1.52	0.502	8.60
-NV14-FB-1A	-200 TM	8.2738	µg/g	8.13	0.945	0.534	7.23
-NV14-FB-1A	-200 TM	8.1833	µg/g	9.51	0.577	0.049	7.30
-NV14-FB-1A (1)	+30 TM	8.0600	µg/g	1.60	2.17	0.000	10.6
-NV14-FB-1A (2)	+30 TM	8.5547	µg/g	1.57	1.38	0.000	10.1
-NV14-FB-1A (3)	+30 TM	6.3040	µg/g	3.54	1.76	0.000	10.6
-NV14-FB-1A Post Spike	-200 TM	8.4321	µg/mL	1.18	3.94	0.823	1.11
recent Recovery				83%	79%	82%	81%
piking Solution			µg/mL	10.4	51.1	10.2	10.3
recent Recovery				104%	102%	102%	103%
heck Standard			µg/mL	5.10	25.5	2.03	5.06
recent Recovery				102%	102%	101%	101%
lank			µg/mL	0.048	0.031	0.000	0.016

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Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.01	25.0	1.94	4.98
Percent Recovery				100%	100%	97%	100%
Calibration Verification Standard			µg/mL	2.59	13.0	1.02	2.61
Percent Recovery				104%	104%	102%	104%
Quantitation Limit Standard 1			µg/mL	0.99	5.03	0.375	1.03
Percent Recovery				99%	101%	94%	103%
Quantitation Limit Standard 2			µg/mL	0.524	2.77	0.194	0.566
Percent Recovery				105%	111%	97%	113%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.005	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.010	0.000
B-NV22-T-1A	TCLP	100.7	µg/mL	0.070	0.700	0.717	0.090
B-NV22-T-1A	TCLP	100.6	µg/mL	0.006	0.598	0.640	0.079
B-NV22-T-1B	TCLP	101.0	µg/mL	0.011	0.495	0.680	0.350
B-NV22-T-1B	TCLP	100.3	µg/mL	0.002	0.448	0.672	0.060
B-NV23-T-1A	TCLP	100.3	µg/mL	0.010	1.63	0.564	1.48
B-NV23-T-1A	TCLP	100.1	µg/mL	0.010	1.80	0.609	0.050
B-NV23-T-1B	TCLP	100.4	µg/mL	0.000	1.87	0.585	0.033
B-NV23-T-1B	TCLP	100.4	µg/mL	0.000	1.71	0.542	0.045
B-NV22-T-1B Pre Spike	TCLP	100.3	µg/mL	1.06	5.04	0.372	0.572
Percent Recovery				106%	96%	71%	108%
B-NV22-T-1B Pre Spike	TCLP	100.3	µg/mL	1.07	5.22	0.374	0.569
Percent Recovery				107%	100%	76%	108%
B-NV22-T-1A Post Spike	TCLP	100.6	µg/mL	1.01	2.10	1.28	1.03
Percent Recovery				101%	92%	99%	99%
Spiking Solution			µg/mL	10.3	20.1	10.0	9.7
Percent Recovery				103%	100%	100%	97%
Check Standard			µg/mL	5.00	25.3	1.95	5.01
Percent Recovery				100%	101%	98%	100%
Blank			µg/mL	0.000	0.004	0.000	0.004
Method Blank (1)	Soil		µg/mL	0.173	0.031	0.004	0.029
Method Blank (2)	Soil		µg/mL	0.075	0.000	0.006	0.017
Method Blank (3)	Soil		µg/mL	0.199	0.000	0.006	0.028
B-NV22-T-1D	-200 TM	7.9976	µg/g	62.5	112	91.5	21.0
B-NV22-T-1D	-200 TM	8.4122	µg/g	63.8	115	91.6	21.2
B-NV22-T-1D	+30 TM	3.2151	µg/g	47.0	51.7	13.2	28.1
B-NV22-T-1E	-200 TM	8.0299	µg/g	62.4	115	82.6	21.2
B-NV22-T-1E	-200 TM	8.1712	µg/g	62.9	113	91.0	21.4
B-NV22-T-1E	+30 TM	6.6324	µg/g	61.3	368	24.7	18.6
B-NV22-T-1D Pre Spike	-200 TM	8.1265	µg/mL	6.65	12.4	5.30	1.68
Percent Recovery				103%	98%	79%	103%
B-NV22-T-1D Pre Spike	-200 TM	8.0264	µg/mL	6.58	12.3	5.24	1.65
Percent Recovery				102%	98%	78%	101%

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
B-NV22-T-1E Post Spike	-200 TM	8.1712	µg/mL	3.58	6.49	4.80	1.84
Percent Recovery				101%	93%	108%	97%
Spiking Solution			µg/mL	10.3	20.2	9.8	10.0
Percent Recovery				103%	101%	98%	100%
Check Standard			µg/mL	4.97	25.1	1.96	4.99
Percent Recovery				99%	100%	98%	100%
Blank			µg/mL	0.000	0.008	0.005	0.005

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			μg/mL				
Check Standard			μg/mL	5.09	25.4	2.01	5.07
Precent Recovery				102%	102%	101%	101%
Calibration Verification Standard			μg/mL	2.54	12.9	1.03	2.58
Precent Recovery				102%	103%	103%	103%
Quantitation Limit Standard 1			μg/mL	0.90	4.73	0.348	0.96
Precent Recovery				90%	95%	87%	96%
Quantitation Limit Standard 2			μg/mL	0.437	2.41	0.164	0.503
Precent Recovery				87%	96%	82%	101%
Blank			μg/mL	0.000	0.000	0.000	0.008
Method Blank (1)	TCLP		μg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		μg/mL	0.000	0.000	0.000	0.000
B-NV25-T-1A	TCLP	100.7	μg/mL	0.000	1.81	1.19	0.047
B-NV25-T-1A	TCLP	101.1	μg/mL	0.000	1.86	1.12	0.055
B-NV25-T-1B	TCLP	100.1	μg/mL	0.000	1.78	0.980	0.070
B-NV25-T-1B	TCLP	100.6	μg/mL	0.000	3.16	1.15	0.061
B-NV26-T-1A	TCLP	101.0	μg/mL	0.000	1.63	0.496	0.034
B-NV26-T-1A	TCLP	100.6	μg/mL	0.000	1.75	0.532	0.072
B-NV26-T-1B	TCLP	101.8	μg/mL	0.000	1.73	0.493	0.308
B-NV26-T-1B	TCLP	100.0	μg/mL	0.000	2.78	0.413	0.108
B-NV26-T-1B Pre Spike	TCLP	100.0	μg/mL	1.08	6.16	0.286	0.616
Precent Recovery				108%	95%	158%	112%
B-NV26-T-1B Pre Spike	TCLP	100.0	μg/mL	1.09	6.74	0.279	0.634
Precent Recovery				109%	107%	145%	116%
B-NV25-T-1A Post Spike	TCLP	101.1	μg/mL	0.909	2.51	1.49	0.923
Precent Recovery				91%	83%	98%	90%
Spiking Solution			μg/mL	10.4	20.3	9.97	10.1
Precent Recovery				104%	101%	100%	101%
Check Standard			μg/mL	5.11	25.48	2.02	5.09
Precent Recovery				102%	102%	101%	102%
Blank			μg/mL	0.000	0.000	0.000	0.005

;ample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL				
;heck Standard			µg/mL	4.98	25.0	1.99	4.96
'recent Recovery				100%	100%	99%	99%
;alibration Verification Standard			µg/mL	2.54	12.9	1.01	2.57
'recent Recovery				102%	103%	101%	103%
;uantitation Limit Standard 1			µg/mL	0.89	4.63	0.371	0.93
'recent Recovery				89%	93%	93%	93%
;uantitation Limit Standard 2			µg/mL	0.401	2.24	0.157	0.452
'recent Recovery				80%	90%	78%	90%
;lank			µg/mL	0.013	0.033	0.000	0.004
/lethod Blank (1)	Soil		µg/mL	0.129	0.085	0.000	0.028
/lethod Blank (2)	Soil		µg/mL	0.088	0.006	0.000	0.0281
/lethod Blank (3)	Soil		µg/mL	0.052	0.000	0.000	0.026
;-NV20-T-1D	-200 TM	7.9943	µg/g	56.1	131	55.5	17.5
;-NV20-T-1D	-200 TM	8.2287	µg/g	52.0	126	56.2	16.9
;-NV20-T-1D (1)	+30 TM	7.5182	µg/g	230	166	5.17	47.2
;-NV20-T-1D (2)	+30 TM	5.8129	µg/g	408	102	2.94	93.1
;-NV20-T-1E	-200 TM	12.6420	µg/g	52.5	123	54.7	16.6
;-NV20-T-1E	-200 TM	12.4100	µg/g	49.6	122	51.2	15.8
;-NV20-T-1E	+30 TM	12.7611	µg/g	131	76.1	7.95	27.1
;-NV20-T-1D Pre Spike	-200 TM	8.1757	µg/mL	6.47	13.2	4.50	1.56
'recent Recovery				104%	97%	112%	105%
;-NV20-T-1D Pre Spike	-200 TM	8.3256	µg/mL	7.11	14.5	4.84	1.73
'recent Recovery				119%	113%	126%	126%
;-NV15-Z-1A		2.0019	µg/g	2840	14127	51.2	227
;-NV15-Z-1A		2.0023	µg/g	2899	14378	45.3	250
;-NV15-Z-1A Pre Spike		2.0027	µg/mL	6.79	30.9	0.397	0.689
'recent Recovery				123%	134%	77%	118%
;-NV15-Z-1A Pre Spike		2.0038	µg/mL	6.25	28.4	0.388	0.629
'recent Recovery				55%	28%	74%	80%
;-NV20-T-1E Post Spike	-200 TM	12.6420	µg/mL	4.29	9.66	4.34	1.91
'recent Recovery				97%	94%	88%	86%
;piking Solution			µg/mL	10.5	20.7	10.2	10.2
'recent Recovery				105%	103%	102%	102%
;heck Standard			µg/mL	5.09	25.6	2.02	5.07
'recent Recovery				102%	102%	101%	101%
;lank			µg/mL	0.010	0.064	0.000	0.013

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.98	24.9	1.99	4.96
Precent Recovery				100%	100%	99%	99%
Calibration Verification Standard			µg/mL	2.63	13.4	1.02	2.67
Precent Recovery				105%	107%	102%	107%
Quantitation Limit Standard 1			µg/mL	0.88	4.53	0.358	0.93
Precent Recovery				88%	91%	90%	93%
Quantitation Limit Standard 2			µg/mL	0.364	2.06	0.163	0.435
Precent Recovery				73%	82%	81%	87%
Blank			µg/mL	0.000	0.000	0.003	0.000
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.007	0.000
B-NV27-T-1A	TCLP	100.3	µg/mL	0.277	3.12	0.165	0.208
B-NV27-T-1A	TCLP	100.8	µg/mL	0.167	2.84	0.089	0.205
B-NV27-T-1B	TCLP	100.3	µg/mL	0.150	2.66	0.109	0.167
B-NV27-T-1B	TCLP	100.0	µg/mL	0.192	2.72	0.185	0.189
B-NV27-T-1B Pre Spike	TCLP	100.3	µg/mL	1.12	6.28	0.105	0.625
Precent Recovery				102%	98%	24%	106%
B-NV27-T-1B Pre Spike	TCLP	100.3	µg/mL	1.12	6.26	0.117	0.625
Precent Recovery				102%	98%	49%	106%
B-NV27-T-1A Post Spike	TCLP	100.3	µg/mL	0.145	1.60	0.644	0.111
Precent Recovery				2%	10%	57%	2%
Spiking Solution			µg/mL	10.3	20.3	10.0	10.1
Precent Recovery				103%	102%	100%	101%
Check Standard			µg/mL	5.04	25.3	2.04	5.04
Precent Recovery				101%	101%	102%	101%
Blank			µg/mL	0.000	0.000	0.019	0.000
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
B-NV16-U-1A	TCLP	100.9	µg/mL	0.824	24.2	0.182	0.337
B-NV16-U-1A	TCLP	100.1	µg/mL	0.604	15.1	0.079	0.313
B-NV16-U-1B	TCLP	101.5	µg/mL	2.50	23.6	0.295	0.396
B-NV16-U-1B	TCLP	101.1	µg/mL	0.544	10.7	0.058	0.346
B-NV20-U-1A	TCLP	100.2	µg/mL	1.09	24.5	0.166	0.325
B-NV20-U-1A	TCLP	100.7	µg/mL	1.46	20.3	0.093	0.366
B-NV20-U-1B	TCLP	100.6	µg/mL	1.04	18.6	0.075	0.297
B-NV20-U-1B	TCLP	100.3	µg/mL	0.805	19.3	0.057	0.332
B-NV20-U-1B Pre Spike	TCLP	100.3	µg/mL	1.42	14.4	0.079	0.715
Precent Recovery				102%	94%	101%	110%
B-NV20-U-1B Pre Spike	TCLP	100.3	µg/mL	1.46	14.9	0.078	0.701
Precent Recovery				106%	105%	98%	107%
B-NV21-U-1A	TCLP	100.5	µg/mL	0.548	15.6	0.058	0.651
B-NV21-U-1A	TCLP	101.2	µg/mL	0.619	21.9	0.222	0.272
B-NV21-U-1B	TCLP	100.9	µg/mL	0.825	54.3	0.171	0.266
B-NV21-U-1B	TCLP	100.4	µg/mL	2.65	57.3	0.301	0.369
B-NV16-U-1A Post Spike	TCLP	100.9	µg/mL	1.33	12.7	1.02	1.10
Precent Recovery				95%	89%	94%	95%
Spiking Solution			µg/mL	10.4	20.6	9.9	10.1
Precent Recovery				104%	103%	99%	101%
Check Standard			µg/mL	5.04	25.5	2.00	5.03

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Precent Recovery				101%	102%	100%	101%
Blank			µg/mL	0.000	0.000	0.000	0.001

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.04	25.3	1.95	5.01
Precent Recovery				101%	101%	97%	100%
Calibration Verification Standard			µg/mL	2.67	13.4	1.03	2.67
Precent Recovery				107%	107%	103%	107%
Quantitation Limit Standard 1			µg/mL	0.966	4.87	0.315	0.95
Precent Recovery				97%	97%	79%	95%
Quantitation Limit Standard 2			µg/mL	0.462	2.38	0.144	0.447
Precent Recovery				92%	95%	72%	89%
Blank			µg/mL	0.000	0.003	0.000	0.000
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.040	0.000
B-NV29-T-1A	TCLP	100.2	µg/mL	0.432	3.47	0.074	0.127
B-NV29-T-1A	TCLP	100.8	µg/mL	0.462	3.49	0.652	0.164
B-NV29-T-1B	TCLP	100.7	µg/mL	0.464	3.41	0.036	0.461
B-NV29-T-1B	TCLP	100.3	µg/mL	0.461	3.37	0.085	0.155
B-NV30-T-1A	TCLP	100.0	µg/mL	0.375	3.73	0.073	0.424
B-NV30-T-1A	TCLP	100.5	µg/mL	0.379	3.39	0.000	0.177
B-NV30-T-1B	TCLP	100.1	µg/mL	0.355	3.64	0.021	0.122
B-NV30-T-1B	TCLP	100.3	µg/mL	0.357	3.35	0.072	0.156
B-DC02-T-A	TCLP	100.4	µg/mL	0.131	1.87	0.381	0.015
B-DC02-T-A	TCLP	100.1	µg/mL	0.092	1.72	0.363	0.098
B-DC02-T-B	TCLP	100.4	µg/mL	0.103	1.96	0.529	0.028
B-DC02-T-B	TCLP	100.8	µg/mL	0.097	1.86	0.457	0.010
B-DC02-T-B Pre Spike	TCLP	100.8	µg/mL	1.00	4.99	0.265	0.468
Precent Recovery				95%	81%	74%	93%
B-DC02-T-B Pre Spike	TCLP	100.8	µg/mL	0.976	5.51	0.296	0.532
Precent Recovery				93%	92%	136%	105%
B-NV30-T-1A Post Spike	TCLP	100.0	µg/mL	1.08	3.33	0.986	1.13
Precent Recovery				91%	83%	95%	94%
Spiking Solution			µg/mL	9.6	18.8	9.8	9.5
Precent Recovery				96%	94%	98%	95%
Check Standard			µg/mL	4.82	24.2	1.92	4.83
Precent Recovery				96%	97%	96%	97%
Blank			µg/mL	0.000	0.000	0.000	0.000

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.04	25.2	2.02	5.03
Precent Recovery				101%	101%	101%	101%
Calibration Verification Standard			µg/mL	2.32	11.5	0.88	2.31
Precent Recovery				93%	92%	88%	92%
Quantitation Limit Standard 1			µg/mL	1.03	5.08	0.332	1.03
Precent Recovery				103%	102%	83%	103%
Quantitation Limit Standard 2			µg/mL	0.488	2.41	0.141	0.486
Precent Recovery				98%	96%	71%	97%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
B-DC03-T-1A	TCLP	100.6	µg/mL	0.098	1.35	0.278	0.075
B-DC03-T-1A	TCLP	101.6	µg/mL	0.097	1.53	0.266	0.102
B-DC03-T-1B	TCLP	100.2	µg/mL	0.092	1.29	0.364	0.105
B-DC03-T-1B	TCLP	101.1	µg/mL	0.095	1.28	0.314	0.083
B-DC03-T-1B	TCLP	101.1	µg/mL	1.08	5.47	0.162	0.575
Precent Recovery				104%	97%	10%	107%
B-DC03-T-1B	TCLP	101.1	µg/mL	1.09	5.43	0.195	0.572
Precent Recovery				104%	96%	75%	106%
B-DC03-T-1A	TCLP	100.6	µg/mL	1.02	2.44	1.10	0.999
Precent Recovery				98%	92%	98%	97%
Spiking Solution			µg/mL	10.5	20.6	10.2	10.2
Precent Recovery				105%	103%	102%	102%
Check Standard			µg/mL	5.06	25.4	2.01	5.06
Precent Recovery				101%	102%	101%	101%
Blank			µg/mL	0.000	0.000	0.000	0.000

Fort Polk Demonstration Project
Project #: G337318-26
Analyst: K. Blann

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1:37 PM

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.03	25.2	2.03	5.03
Precent Recovery				101%	101%	101%	101%
Calibration Verification Standard			µg/mL	2.72	13.5	1.06	2.71
Precent Recovery				109%	108%	106%	108%
Quantitation Limit Standard 1			µg/mL	1.01	5.02	0.401	1.01
Precent Recovery				101%	100%	100%	101%
Quantitation Limit Standard 2			µg/mL	0.518	2.54	0.211	0.514
Precent Recovery				104%	102%	105%	103%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.022
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.005
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.000
B-NV23-T-1D	-200 TM	8.1295	µg/g	68.1	213	104	19.0
B-NV23-T-1D	-200 TM	8.0549	µg/g	69.2	228	106	19.7
B-NV23-T-1D Pre Spike	-200 TM	8.2376	µg/mL	6.82	16.8	6.12	1.63
Precent Recovery				99%	93%	89%	102%
B-NV23-T-1D Pre Spike	-200 TM	8.1479	µg/mL	6.91	16.8	6.31	1.64
Precent Recovery				102%	94%	100%	105%
B-NV23-T-1D	+30 TM	7.8007	µg/g	771	1005	33.9	103
B-NV23-T-1E	-200 TM	8.3567	µg/g	68.8	234	108	19.4
B-NV23-T-1E	-200 TM	8.0731	µg/g	65.5	229	107	18.8
B-NV23-T-1E	+30 TM	11.5764	µg/g	193	973	31.4	30.1
B-NV21-T-1D	+30 TM	3.8696	µg/g	770	71.0	9.09	163.7
B-NV21-T-1D Post Spike	-200 TM	8.1295	µg/mL	3.61	10.5	5.01	1.57
Precent Recovery				84%	89%	77%	80%
Spiking Solution			µg/mL	9.7	19.9	9.7	9.6
Precent Recovery				97%	100%	97%	96%
Check Standard			µg/mL	5.11	26.1	2.02	5.18
Precent Recovery				102%	105%	101%	104%
Blank			µg/mL	0.000	0.004	0.000	0.007
Method Blank (1)	Soil		µg/mL	0.000	0.024	0.000	0.012
B-NV21-T-1D	-200 TM	7.9379	µg/g	56.6	129	81.1	17.4
B-NV21-T-1D	-200 TM	8.1170	µg/g	69.0	147	81.1	19.4
B-NV21-T-1E	-200 TM	8.0540	µg/g	56.2	134	82.5	18.1
B-NV21-T-1E	-200 TM	8.4587	µg/g	54.5	127	77.5	17.8
B-NV21-T-1E	+30 TM	6.3546	µg/g	140	88.1	9.52	63.5
B-NV21-T-1D Post Spike	-200 TM	7.9379	µg/g	2.98	6.60	3.89	1.46
Precent Recovery				73%	74%	68%	77%
Spiking Solution			µg/mL	9.78	20.0	9.53	9.64
Precent Recovery				98%	100%	95%	96%
Check Standard			µg/mL	5.08	26.0	2.02	5.13
Precent Recovery				102%	104%	101%	103%
Blank			µg/mL	0.003	0.000	0.000	0.010

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.04	25.1	2.01	4.99
Precent Recovery				101%	100%	100%	100%
Calibration Verification Standard			µg/mL	2.66	13.4	1.03	2.66
Precent Recovery				107%	107%	103%	106%
Quantitation Limit Standard 1			µg/mL	1.11	5.49	0.416	1.10
Precent Recovery				111%	110%	104%	110%
Quantitation Limit Standard 2			µg/mL	0.549	2.70	0.187	0.551
Precent Recovery				110%	108%	93%	110%
Blank			µg/mL	0.000	0.000	0.012	0.006
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.027	0.003
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.017	0.001
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.002	0.001
3-DC04-T-1A	TCLP	100.9	µg/mL	0.725	4.39	0.149	0.234
3-DC04-T-1A	TCLP	100.1	µg/mL	0.215	1.73	0.111	0.136
3-DC04-T-1B	TCLP	100.3	µg/mL	0.183	1.69	0.180	0.123
3-DC04-T-1B	TCLP	101.3	µg/mL	0.195	1.60	0.149	0.132
3-DC04-T-1B Pre Spike	TCLP	101.3	µg/mL	1.10	5.39	0.107	0.546
Precent Recovery				100%	92%	64%	96%
3-DC04-T-1B Pre Spike	TCLP	101.3	µg/mL	1.11	5.38	0.160	0.589
Precent Recovery				101%	92%	171%	105%
3-NV22-U-1A	TCLP	100.8	µg/mL	0.842	12.8	0.156	0.381
3-NV22-U-1A	TCLP	100.3	µg/mL	0.678	25.7	0.176	0.377
3-NV22-U-Rt	TCLP	100.2	µg/mL	1.39	21.6	0.048	0.356
3-DC04-T-1A Post Spike	TCLP	100.1	µg/mL	1.12	2.77	1.07	1.07
Precent Recovery				103%	100%	102%	100%
Spiking Solution			µg/mL	10.0	20.8	9.6	9.6
Precent Recovery				100%	104%	96%	96%
Check Standard			µg/mL	5.13	25.5	2.01	5.08
Precent Recovery				103%	102%	100%	102%
Blank			µg/mL	0.000	0.000	0.000	0.001

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			μg/mL				
Check Standard			μg/mL	5.01	25.0	1.99	5.00
Precent Recovery				100%	100%	99%	100%
Calibration Verification Standard			μg/mL	2.76	13.5	1.06	2.73
Precent Recovery				111%	108%	106%	109%
Quantitation Limit Standard 1			μg/mL	1.12	5.46	0.427	1.10
Precent Recovery				112%	109%	107%	110%
Quantitation Limit Standard 2			μg/mL	0.577	2.75	0.203	0.562
Precent Recovery				115%	110%	101%	112%
Blank			μg/mL	0.007	0.005	0.007	0.006
Method Blank (1)	Soil		μg/mL	0.000	0.000	0.017	0.004
Method Blank (2)	Soil		μg/mL	0.000	0.000	0.009	0.001
Method Blank (3)	Soil		μg/mL	0.000	0.000	0.002	0.002
B-NV25-T-1D	-200 TM	8.0820	μg/g	81.5	236	118	24.3
B-NV25-T-1D	-200 TM	7.9417	μg/g	71.8	241	116	21.9
B-NV25-T-1D Pre Spike	-200 TM	8.0453	μg/mL	7.01	17.2	6.02	1.67
Precent Recovery				103%	93%	67%	99%
B-NV25-T-1D Pre Spike	-200 TM	8.3372	μg/mL	7.02	17.3	6.05	1.69
Precent Recovery				101%	91%	61%	97%
B-NV25-T-1D	+30 TM	10.8637	μg/g	846	421	21.3	107
B-NV25-T-1E	-200 TM	7.9883	μg/g	73.6	237	114	21.5
B-NV25-T-1E	-200 TM	8.2104	μg/g	75.3	221	116	21.7
B-NV25-T-1E	+30 TM	12.0212	μg/g	663	202	20.1	128
Check Standard			μg/mL	5.15	25.6	2.03	5.11
Precent Recovery				103%	102%	102%	102%
Blank			μg/mL	0.001	0.000	0.018	0.005
B-NV26-T-1E	+30 TM	4.5494	μg/g	218	1118	36.3	35.3
B-NV25-T-1D Post Spike	-200 TM	8.0820	μg/g	4.08	11.2	5.49	1.74
Precent Recovery				78%	80%	71%	76%
Spiking Solution			μg/mL	10.3	20.6	9.72	9.88
Precent Recovery				103%	103%	97%	99%
Check Standard			μg/mL	5.01	25.1	1.96	5.02
Precent Recovery				100%	100%	98%	100%
Blank			μg/mL	0.000	0.022	0.008	0.001
Method Blank (1)	TCLP		μg/mL	0.008	0.024	0.004	0.006
Method Blank (2)	TCLP		μg/mL	0.000	0.000	0.007	0.000
B-DC05-T-1A	TCLP	100.3	μg/mL	0.114	1.48	0.216	0.077
B-DC05-T-1A	TCLP	101.6	μg/mL	0.096	1.24	0.186	0.079
B-DC05-T-1B	TCLP	101.0	μg/mL	0.139	7.54	0.406	0.372
B-DC05-T-1B	TCLP	100.9	μg/mL	0.122	1.96	0.218	0.114
Check Standard			μg/mL	4.90	24.5	1.98	4.94
Precent Recovery				98%	98%	99%	99%
B-DC05-T-1B Re Run	TCLP	101.0	μg/mL	0.154	7.56	0.465	0.381
B-DC06-T-1A	TCLP	100.3	μg/mL	0.074	0.848	0.517	0.035
B-DC06-T-1A	TCLP	100.2	μg/mL	0.060	0.712	0.555	0.296
B-DC06-T-1B	TCLP	101.7	μg/mL	0.053	0.728	0.608	0.074
B-DC06-T-1B	TCLP	100.4	μg/mL	0.057	0.739	0.522	0.072

;ample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
3-DC06-T-1B Pre Spike	TCLP	100.4	µg/mL	1.13	4.95	0.322	0.575
?recent Recovery				110%	92%	122%	108%
3-DC06-T-1B Pre Spike	TCLP	100.4	µg/mL	1.08	5.31	0.322	0.544
?recent Recovery				105%	99%	121%	102%
3-DC06-T-1A Post Spike	TCLP	100.3	µg/mL	1.05	2.52	1.08	1.02
?recent Recovery				102%	107%	85%	101%
;piking Solution			µg/mL	10.0	20.1	9.43	9.71
?recent Recovery				100%	101%	94%	97%
:heck Standard			µg/mL	5.11	25.4	1.99	5.09
?recent Recovery				102%	101%	100%	102%
3lank			µg/mL	0.001	0.009	0.000	0.006

Fort Polk Demonstration Project
Project #: G337318-26
Analyst: K. Blann

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1:38 PM

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.94	24.6	2.01	4.93
Precent Recovery				99%	98%	101%	99%
Calibration Verification Standard			µg/mL	2.72	13.7	1.05	2.72
Precent Recovery				109%	109%	105%	109%
Quantitation Limit Standard 1			µg/mL	0.993	5.04	0.402	0.991
Precent Recovery				99%	101%	100%	99%
Quantitation Limit Standard 2			µg/mL	0.503	2.53	0.188	0.491
Precent Recovery				101%	101%	94%	98%
Blank			µg/mL	0.005	0.015	0.004	0.000
Method Blank (1)	Soil		µg/mL	0.009	0.018	0.000	0.031
Method Blank (2)	Soil		µg/mL	0.005	0.013	0.011	0.000
Method Blank (3)	Soil		µg/mL	0.001	0.000	0.000	0.000
B-NV27-T-1D	-200 TM	8.3954	µg/g	54.2	154	77.5	15.5
B-NV27-T-1D	-200 TM	8.0444	µg/g	66.2	154	75.7	17.5
B-NV27-T-1D	+30 TM	8.6272	µg/g	866	1992	90.1	104
B-NV27-T-1E	-200 TM	8.1552	µg/g	54.3	165	79.6	15.0
B-NV27-T-1E	-200 TM	8.2555	µg/g	53.6	154	74.7	14.5
B-NV27-T-1E	-200 TM	8.0314	µg/g	57.4	161	81.2	15.8
B-NV27-T-1E	-200 TM	8.4359	µg/g	67.8	161	79.4	16.7
B-NV27-T-1E	+30 TM	6.7442	µg/g	729	1253	142	86.7
B-DC03-T-1D	+30 TM	8.6226	µg/g	371	157	17.2	45.2
B-NV27-T-1D Post Spike	-200 TM	8.3954	µg/mL	3.05	7.94	3.96	1.39
Precent Recovery				78%	74%	71%	74%
Check Standard			µg/mL	4.83	24.3		
Precent Recovery				97%	97%		
B-NV27-T-1D	+30 TM	8.6272	µg/g	934	2219		
B-NV27-T-1E	+30 TM	6.7442	µg/g	777	1360		
B-DC03-T-1D	+30 TM	8.6226	µg/g	391	177		
Spiking Solution			µg/mL	9.74	19.9	9.58	9.43
Precent Recovery				97%	99%	96%	94%
Check Standard			µg/mL	4.71	24.0	2.00	4.74
Precent Recovery				94%	96%	100%	95%
Blank			µg/mL	0.000	0.012	0.000	0.000

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.17	25.7	2.04	5.12
Precent Recovery				103%	103%	102%	102%
Calibration Verification Standard			µg/mL	2.68	13.3	1.05	2.65
Precent Recovery				107%	106%	105%	106%
Quantitation Limit Standard 1			µg/mL	1.06	5.22	0.433	1.04
Precent Recovery				106%	104%	108%	104%
Quantitation Limit Standard 2			µg/mL	0.541	2.65	0.222	0.528
Precent Recovery				108%	106%	111%	106%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
B-NV22-C-1A	TCLP	100.7	µg/mL	0.230	4.18	0.013	0.059
B-NV22-C-1B	TCLP	100.4	µg/mL	0.292	4.43	0.011	0.051
B-NV22-C-1B	TCLP	100.3	µg/mL	0.312	4.64	0.021	0.292
B-NV22-M-1A	TCLP	100.2	µg/mL	2.11	73.1	2.58	0.175
B-NV22-M-1A	TCLP	100.2	µg/mL	2.11	73.3	2.50	0.289
B-NV22-U-Rt	TCLP	100.3	µg/mL	0.740	73.7	0.335	0.354
B-NV22-U-Rt Pre Spike	TCLP	100.3	µg/mL	1.43	42.3	0.206	0.718
Precent Recovery				106%	110%	77%	108%
B-NV22-U-Rt Pre Spike	TCLP	100.3	µg/mL	1.40	42.1	0.195	0.709
Precent Recovery				103%	105%	56%	106%
B-NV22-C-1A	TCLP	100.1	µg/mL	0.253	4.39	0.000	0.071
B-NV22-C-1A Post Spike	TCLP	100.7	µg/mL	1.10	3.85	1.03	1.00
Precent Recovery				99%	99%	102%	97%
Spiking Solution			µg/mL	10.1	20.1	9.80	9.60
Precent Recovery				101%	101%	98%	96%
Check Standard			µg/mL	5.33	26.1	2.07	5.20
Precent Recovery				107%	104%	103%	104%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.000
B-NV26-T-1D	-200 TM	8.2082	µg/g	49.9	175	72.8	15.0
B-NV26-T-1D	-200 TM	7.9782	µg/g	51.6	185	74.2	15.3
B-NV26-T-1D (1)	+30 TM	7.3180	µg/g	87.1	126	12.9	17.9
B-NV26-T-1D (2)	+30 TM	7.4880	µg/g	78.2	224	19.1	17.8
B-NV26-T-1E	-200 TM	8.2460	µg/g	53.1	183	74.4	14.8
B-NV26-T-1E	-200 TM	7.9828	µg/g	49.6	176	74.3	14.0
B-DC03-T-1D	-200 TM	8.3053	µg/g	46.6	133	70.7	14.8
B-DC03-T-1D	-200 TM	8.2276	µg/g	52.3	136	70.4	15.1
B-DC03-T-1E	+30 TM	10.4566	µg/g	278	392	20.0	34.1
B-NV26-T-1D Post Spike	-200 TM	8.2082	µg/g	2.87	8.76	3.78	1.39
Precent Recovery				83%	79%	80%	78%
Spiking Solution			µg/mL	10.22	20.4	9.76	9.68
Precent Recovery				102%	102%	98%	97%

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Check Standard			µg/mL	5.36	26.1	2.07	5.20
Precent Recovery				107%	104%	104%	104%
Blank			µg/mL	0.000	0.000	0.000	0.000
Check Standard (2)			µg/mL	10.4	50.9	10.1	10.2
Precent Recovery				104%	102%	101%	102%

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.05	25.3	1.99	5.05
Precent Recovery				101%	101%	99%	101%
Calibration Verification Standard			µg/mL	2.64	13.1	1.04	2.62
Precent Recovery				106%	105%	104%	105%
Quantitation Limit Standard 1			µg/mL	0.984	4.88	0.383	0.98
Precent Recovery				98%	98%	96%	98%
Quantitation Limit Standard 2			µg/mL	0.533	2.64	0.230	0.526
Precent Recovery				107%	106%	115%	105%
Blank			µg/mL	0.003	0.066	0.008	0.004
Method Blank (1)	TCLP		µg/mL	0.001	0.000	0.000	0.001
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.007	0.000
Method Blank (3)	TCLP		µg/mL	0.000	0.007	0.000	0.000
B-NV22-K-1A	TCLP	101.6	µg/mL	1.05	16.2	0.388	0.186
B-NV22-K-1A	TCLP	101.0	µg/mL	1.09	13.2	0.200	0.187
B-NV22-K-1B	TCLP	100.2	µg/mL	0.934	13.1	0.163	0.202
B-NV22-K-1B	TCLP	100.1	µg/mL	0.942	12.9	0.260	0.180
B-NV25-U-1A	TCLP	100.5	µg/mL	0.586	32.5	0.092	0.134
B-NV25-U-1A	TCLP	100.5	µg/mL	1.15	49.8	0.118	0.299
B-NV25-U-1B	TCLP	100.6	µg/mL	0.690	22.0	0.057	0.293
B-NV25-U-1B	TCLP	100.1	µg/mL	0.735	23.6	0.052	0.258
B-NV22-K-1A Post Spike	TCLP	101.6	µg/mL	1.50	12.0	1.18	1.12
Precent Recovery				102%	95%	100%	104%
Spiking Solution			µg/mL	10.3	50.8	9.93	10.3
Precent Recovery				103%	102%	99%	103%
Check Standard			µg/mL	5.04	25.2	1.97	5.03
Precent Recovery				101%	101%	98%	101%
Blank			µg/mL	0.006	0.075	0.010	0.006
Method Blank (1)	Soil		µg/mL	0.003	0.059	0.005	0.008
Method Blank (2)	Soil		µg/mL	0.000	0.045	0.000	0.005
Method Blank (3)	Soil		µg/mL	0.000	0.026	0.014	0.004
B-NV29-T-1D	-200 TM	8.3155	µg/g	76.4	217	126	20.9
B-NV29-T-1D	-200 TM	8.3211	µg/g	77.2	212	126	20.8
B-NV29-T-1D Pre Spike	-200 TM	8.2850	µg/g	7.57	16.5	7.30	1.69
Precent Recovery				109%	96%	103%	103%
B-NV29-T-1D Pre Spike	-200 TM	8.1120	µg/g	7.17	16.8	7.33	1.65
Precent Recovery				101%	102%	110%	100%
B-NV29-T-1D (1)	+30 TM	8.2379	µg/g	1924	813	36.9	216
B-NV29-T-1D (1)	+30 TM	8.2379	µg/g	2021	916	42.1	235
B-NV29-T-1D (2)	+30 TM	7.6830	µg/g	291	2603	51.7	38.6
B-NV29-T-1D (2)	+30 TM	7.6830	µg/g	313	3011	55.0	43.3
B-NV29-T-1E	-200 TM	8.3179	µg/g	81.3	230	132	22.3
B-NV29-T-1E	-200 TM	7.9429	µg/g	74.3	214	129	20.5
B-NV30-T-1D (1)	+30 TM	6.8107	µg/g	1025	1459	132	118
B-NV30-T-1D (1)	+30 TM	6.8107	µg/g	1006	1481	129	118
B-NV29-T-1D Post Spike	-200 TM	8.3155	µg/g	3.95	12.7	5.89	1.67
Precent Recovery				77%	73%	66%	80%

Fort Polk Demonstration Project
Project #: G337318-26
Analyst: K. Blann

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Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Spiking Solution			µg/mL	10.0	49.4	9.71	10.0
Precent Recovery				100%	99%	97%	100%
Check Standard			µg/mL	4.88	24.4	1.89	4.87
Precent Recovery				98%	98%	94%	97%
Blank			µg/mL	0.006	0.069	0.013	0.008

ample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL				
heck Standard			µg/mL	5.04	25.1	2.03	5.01
recent Recovery				101%	100%	102%	100%
alibration Verification Standard			µg/mL	2.74	13.6	1.08	2.71
recent Recovery				110%	109%	108%	109%
uantitation Limit Standard 1			µg/mL	1.08	5.29	0.425	1.07
recent Recovery				108%	106%	106%	107%
uantitation Limit Standard 2			µg/mL	0.536	2.64	0.239	0.529
recent Recovery				107%	106%	120%	106%
lank			µg/mL	0.000	0.006	0.000	0.001
ethod Blank (1)	TCLP		µg/mL	0.000	0.000	0.045	0.001
ethod Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
ethod Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
-NV26-U-1A	TCLP	100.3	µg/mL	0.717	18.9	0.158	0.348
-NV26-U-1A	TCLP	100.7	µg/mL	0.745	21.7	0.102	0.363
-NV26-U-1B	TCLP	100.6	µg/mL	1.09	48.5	0.379	0.341
-NV26-U-1B	TCLP	100.1	µg/mL	0.865	56.0	0.982	0.466
-DC03-U-1A	TCLP	100.3	µg/mL	0.856	109	3.00	0.300
-DC03-U-1A	TCLP	100.1	µg/mL	0.607	11.9	0.142	0.612
-DC03-U-1B	TCLP	100.5	µg/mL	0.621	20.8	0.182	0.278
-DC03-U-1B	TCLP	101.3	µg/mL	0.618	20.2	0.300	0.247
-NV26-U-1A Post Spike	TCLP	100.3	µg/mL	1.37	13.5	1.09	1.23
recent Recovery				104%	100%	102%	107%
piking Solution			µg/mL	10.4	51.3	9.98	10.4
recent Recovery				104%	103%	100%	104%
heck Standard			µg/mL	5.25	25.7	2.05	5.21
recent Recovery				105%	103%	102%	104%
lank			µg/mL	0.000	0.000	0.000	0.007

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Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.04	25.2	2.02	5.01
Precent Recovery				101%	101%	101%	100%
Calibration Verification Standard			µg/mL	2.48	12.3	1.00	2.43
Precent Recovery				99%	98%	100%	97%
Quantitation Limit Standard 1			µg/mL	1.03	5.07	0.405	0.97
Precent Recovery				103%	101%	101%	97%
Quantitation Limit Standard 2			µg/mL	0.523	2.56	0.219	0.455
Precent Recovery				105%	102%	110%	91%
Blank			µg/mL	0.000	0.015	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.000	0.065	0.000	0.036
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.042	0.000
B-NV29-T-1E (1)	+30 TM	7.8198	µg/g	106	691	81.6	19.5
B-NV29-T-1E (1)	+30 TM	7.8198	µg/g	108	762	84.4	16.1
B-NV29-T-1E (2)	+30 TM	7.8189	µg/g	920	809	88.8	109
B-NV29-T-1E (2)	+30 TM	7.8189	µg/g	911	850	90.5	104
B-NV30-T-1E	-200 TM	8.1941	µg/g	59.3	219	90.8	14.4
B-NV30-T-1E	-200 TM	8.0782	µg/g	57.5	216	91.3	14.2
B-NV30-T-1E (1)	+30 TM	7.8052	µg/g	539	1470	151	67.4
B-NV30-T-1E (1)	+30 TM	7.8052	µg/g	580	1667	163	67.6
B-NV30-T-1E (2)	+30 TM	7.1641	µg/g	130	1472	40.2	24.7
B-NV30-T-1E (2)	+30 TM	7.1641	µg/g	139	1671	43.0	17.9
B-NV30-T-1D	-200 TM	8.2454	µg/g	58.8	227	94.4	14.6
B-NV30-T-1D	-200 TM	8.0571	µg/g	59.8	227	96.9	14.6
B-DC03-T-1E	-200 TM	7.9404	µg/g	41.6	126	68.5	11.5
B-NV30-T-1E Post Spike	-200 TM	8.1941	µg/g	3.27	13.0	4.80	1.41
Precent Recovery				84%	79%	108%	82%
Spiking Solution			µg/mL	10.1	50.3	10.2	10.2
Precent Recovery				101%	101%	102%	102%
Check Standard			µg/mL	5.08	25.3	2.06	5.03
Precent Recovery				102%	101%	103%	101%
Blank			µg/mL	0.005	0.017	0.001	0.000
Method Blank (1)	TCLP		µg/mL	0.014	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.001	0.000	0.000	0.000
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
B-DC12-T-1A	TCLP	101.4	µg/mL	0.170	2.80	0.642	0.000
B-DC12-T-1A	TCLP	100.7	µg/mL	0.155	2.59	0.621	0.000
B-DC12-T-1B	TCLP	101.7	µg/mL	0.177	2.94	0.692	0.580
B-DC12-T-1B	TCLP	100.7	µg/mL	0.164	2.35	0.692	0.000
B-DC12-T-1B Pre spike	TCLP	100.7	µg/mL	1.05	5.99	0.377	0.459
Precent Recovery				96%	96%	61%	92%
B-DC12-T-1B Pre spike	TCLP	100.7	µg/mL	1.08	6.10	0.408	0.520
Precent Recovery				99%	99%	125%	104%
B-DC12-T-1A Post Spike	TCLP	101.4	µg/mL	0.999	5.62	1.24	0.919
Precent Recovery				92%	87%	96%	92%
Spiking Solution			µg/mL	9.9	49.6	9.99	10.0
Precent Recovery				99%	99%	100%	100%

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Check Standard			µg/mL	4.96	24.8	1.99	4.92
Precent Recovery				99%	99%	100%	98%
Blank			µg/mL	0.000	0.003	0.014	0.000

Fort Polk Demonstration Project
Project #: G337318-26
Analyst: K. Blann

Dec. 17

5/13/97

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.00	24.9	1.99	4.98
Precent Recovery				100%	99%	99%	100%
Calibration Verification Standard			µg/mL	2.58	12.8	1.00	2.57
Precent Recovery				103%	102%	100%	103%
Quantitation Limit Standard 1			µg/mL	1.02	4.93	0.411	1.00
Precent Recovery				102%	99%	103%	100%
Quantitation Limit Standard 2			µg/mL	0.522	2.55	0.193	0.518
Precent Recovery				104%	102%	97%	104%
Blank			µg/mL	0.000	0.009	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.000	0.014	0.000	0.001
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.000
B-DC03-T-1E	-200 TM	8.4434	µg/g	45.0	125	66.4	14.3
B-DC04-T-1D	-200 TM	8.2388	µg/g	40.9	113	66.1	13.6
B-DC04-T-1D	-200 TM	8.1853	µg/g	41.5	107	66.5	13.4
B-DC04-T-1D Pre Spike	-200 TM	8.1655	µg/g	5.50	11.6	4.40	1.32
Precent Recovery				95%	91%	84%	97%
B-DC04-T-1D Pre Spike	-200 TM	8.2787	µg/g	5.59	12.0	4.23	1.35
Precent Recovery				97%	94%	74%	99%
B-DC04-T-1D	+30 TM	3.1694	µg/g	331	392	20.9	46.0
B-DC04-T-1D	+30 TM	3.1694	µg/g	328	378	11.1	49.6
B-DC04-T-1E	-200 TM	8.1561	µg/g	41.9	109	64.4	13.7
B-DC04-T-1E	-200 TM	8.2638	µg/g	46.9	121	63.5	15.1
B-DC04-T-1E	+30 TM	2.9952	µg/g	7125	80.8	13.5	787
B-DC04-T-1E	+30 TM	2.9952	µg/g	7409	66.4	5.78	815
B-DC03-T-1E Post Spike	-200 TM	8.4434	µg/g	2.73	9.10	3.65	1.43
Precent Recovery				83%	76%	85%	82%
Spiking Solution			µg/mL	10.5	51.3	10.2	10.6
Precent Recovery				105%	103%	102%	106%
Check Standard			µg/mL	5.17	25.4	2.04	5.16
Precent Recovery				103%	101%	102%	103%
Blank			µg/mL	0.000	0.005	0.000	0.000

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.07	25.1	2.00	5.01
Precent Recovery				101%	100%	100%	100%
Calibration Verification Standard			µg/mL	2.89	14.4	1.03	2.87
Precent Recovery				116%	115%	103%	115%
Quantitation Limit Standard 1			µg/mL	1.05	5.22	0.432	1.04
Precent Recovery				105%	104%	108%	104%
Quantitation Limit Standard 2			µg/mL	0.542	2.66	0.221	0.541
Precent Recovery				108%	106%	110%	108%
Blank			µg/mL	0.000	0.019	0.000	0.000
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
B-DC04-U-1A	TCLP	100.1	µg/mL	0.542	12.6	0.036	0.214
B-DC04-U-1A	TCLP	100.4	µg/mL	0.562	8.03	0.338	0.235
B-DC04-U-1B	TCLP	101.2	µg/mL	5.75	13.7	0.004	0.397
B-DC04-U-1B	TCLP	100.2	µg/mL	1.21	20.6	0.250	0.255
B-DC02-L-1A	TCLP	101.6	µg/mL	1.01	9.33	0.108	0.410
B-DC02-L-1A	TCLP	100.0	µg/mL	1.14	10.6	0.139	0.437
B-DC03-FB-1A	TCLP	100.4	µg/mL	0.000	0.000	0.000	0.025
B-DC03-FB-1A	TCLP	100.0	µg/mL	0.000	0.000	0.000	0.037
B-DC02-F-1A	TCLP	100.0	µg/mL	0.255	2.77	0.038	0.206
B-DC02-F-1A	TCLP	100.6	µg/mL	0.478	2.80	0.069	0.228
B-DC04-U-1A Post Spike	TCLP	100.1	µg/mL	1.25	10.8	0.989	1.07
Precent Recovery				100%	103%	97%	98%
Spiking Solution			µg/mL	10.2	49.8	9.84	9.87
Precent Recovery				102%	100%	98%	99%
Check Standard			µg/mL	5.16	25.6	2.04	5.10
Precent Recovery				103%	103%	102%	102%
Blank			µg/mL	0.000	0.000	0.000	0.002
Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.012
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.003
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.002
B-DC02-T-1D	-200 TM	8.2591	µg/g	46.6	163	64.4	12.5
B-DC02-T-1D	-200 TM	8.0306	µg/g	48.4	163	64.1	13.0
B-DC02-T-1D Pre Spike	-200 TM	7.9758	µg/g	5.84	14.1	4.49	1.30
Precent Recovery				98%	95%	97%	97%
B-DC02-T-1D Pre Spike	-200 TM	8.0422	µg/g	5.88	14.3	4.58	1.32
Precent Recovery				98%	96%	100%	99%
B-DC02-T-1D	+30 TM	7.5065	µg/g	609	669	81.7	72.4
B-DC02-T-1D	+30 TM	7.5065	µg/g	672	774	91.6	86.8
B-DC02-T-1E	-200 TM	8.0172	µg/g	49.1	173	65.9	13.2
B-DC02-T-1E	-200 TM	8.1420	µg/g	50.5	175	67.0	13.4
B-DC02-T-1E	+30 TM	8.7437	µg/g	810	1923	101	94.1
B-DC02-T-1E	+30 TM	8.7437	µg/g	897	2255	104	108
B-DC02-T-1D Post Spike	-200 TM	8.2591	µg/g	2.66	10.2	3.39	1.25
Precent Recovery				73%	70%	73%	73%
Spiking Solution			µg/mL	10.0	48.6	9.62	9.65
Precent Recovery				100%	97%	96%	96%

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Check Standard			µg/mL	5.10	25.2	2.00	5.01
Precent Recovery				102%	101%	100%	100%
Blank			µg/mL	0.000	0.000	0.000	0.002

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.96	25.0	2.00	5.00
Precent Recovery				99%	100%	100%	100%
Calibration Verification Standard			µg/mL	2.62	13.0	1.01	2.64
Precent Recovery				105%	104%	101%	106%
Quantitation Limit Standard 1			µg/mL	1.04	5.19	0.409	1.05
Precent Recovery				104%	104%	102%	105%
Quantitation Limit Standard 2			µg/mL	0.522	2.62	0.196	0.524
Precent Recovery				104%	105%	98%	105%
Blank			µg/mL	0.004	0.031	0.000	0.002
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.006	0.000
Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
3-NV26-Qf-1A			µg/mL	7.52	103	0.434	2.33
3-DC06-Qf-1A			µg/mL	7.36	88.2	0.347	1.36
3-NV26-Qc-1A			µg/mL	0.656	7.66	0.029	0.105
3-DC06-Qc-1A			µg/mL	1.15	15.3	0.024	0.411
3-DC06-L-1A	TCLP	100.5	µg/mL	1.26	10.4	0.191	0.822
3-DC06-L-1A	TCLP	100.7	µg/mL	1.21	13.4	0.288	0.490
3-NV25-P-1A	TCLP	100.6	µg/mL	50.6	1544	0.016	11.2
3-NV25-P-1A	TCLP	100.7	µg/mL	46.3	1403	0.116	10.1
3-DC06-P-1A	TCLP	100.0	µg/mL	55.3	OVR	0.000	14.0
3-DC06-P-1A	TCLP	101.1	µg/mL	54.8	OVR	0.000	14.4
3-DC06-P-1A Post Spike	TCLP	101.1	µg/mL	51.3	OVR	1.00	14.7
Precent Recovery				2670%	NA	100%	822%
Spiking Solution			µg/mL	10.4	50.7	10.3	10.3
Precent Recovery				104%	101%	103%	103%
Check Standard			µg/mL	5.01	24.5	2.03	5.03
Precent Recovery				100%	98%	101%	101%
Blank			µg/mL	0.008	0.053	0.002	0.000
3-DC05-K-1A	TCLP	100.2	µg/mL	1.97	97.0	1.46	0.330
3-DC05-K-1A	TCLP	101.5	µg/mL	4.63	52.4	1.21	0.489
3-DC05-K-1B	TCLP	100.0	µg/mL	1.11	57.7	0.985	0.162
3-DC05-K-1B	TCLP	100.5	µg/mL	0.999	50.7	0.969	0.189
3-DC05-C-1A	TCLP	100.1	µg/mL	0.406	10.0	0.063	0.163
3-DC05-C-1A	TCLP	100.5	µg/mL	0.378	8.31	0.042	0.379
3-DC05-C-1B	TCLP	101.9	µg/mL	4.33	146	0.044	1.05
3-DC05-C-1B	TCLP	100.5	µg/mL	0.564	12.3	0.018	0.169
3-DC05-C-1A Post Spike	TCLP	100.1	µg/mL	1.19	9.29	1.04	1.10
Precent Recovery				101%	96%	101%	103%
Spiking Solution			µg/mL	10.2	49.9	10.3	10.3
Precent Recovery				102%	100%	103%	103%
Check Standard			µg/mL	5.09	25.0	2.03	5.11
Precent Recovery				102%	100%	101%	102%
Blank			µg/mL	0.011	0.000	0.000	0.000

Fort Polk Demonstration Project
Project #: G337318-26
Analyst: A.D. Weiss

Dec. 31

5/13/97

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.91	24.7	1.98	4.95
Precent Recovery				98%	99%	99%	99%
Calibration Verification Standard			µg/mL	2.50	12.6	1.01	2.53
Precent Recovery				100%	101%	101%	101%
Quantitation Limit Standard 1			µg/mL	1.02	5.12	0.389	1.04
Precent Recovery				102%	102%	97%	104%
Quantitation Limit Standard 2			µg/mL	0.511	2.57	0.210	0.519
Precent Recovery				102%	103%	105%	104%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.001	0.000
B-DC05-T-1D	-200 TM	8.2168	µg/g	47.4	129	76.5	15.7
B-DC05-T-1D	-200 TM	8.3353	µg/g	56.8	128	77.4	16.8
B-DC05-T-1D Pre Spike	-200 TM	8.0473	µg/mL	5.90	12.6	4.96	1.40
Precent Recovery				90%	93%	92%	91%
B-DC05-T-1D Pre Spike	-200 TM	8.1624	µg/mL	5.60	12.3	4.90	1.33
Precent Recovery				82%	88%	87%	81%
B-DC05-T-1D	+30 TM	2.3005	µg/g	6842	131	11.1	802
B-DC05-T-1E	-200 TM	8.1989	µg/g	49.9	122	77.3	14.2
B-DC05-T-1E	-200 TM	8.1702	µg/g	46.5	128	79.7	14.6
B-DC05-T-1E	+30 TM	8.8955	µg/g	582	96.3	13.9	70.1
B-DC05-T-1E Post Spike	-200 TM	8.1989	µg/mL	2.90	10.0	4.21	1.57
Precent Recovery				85%	101%	104%	98%
Spiking Solution			µg/mL	9.87	50.7	10.0	10.2
Precent Recovery				99%	101%	100%	102%
Check Standard			µg/mL	4.88	25.1	1.99	5.02
Precent Recovery				98%	100%	99%	100%
Blank			µg/mL	0.045	0.000	0.000	0.000
B-NV25-P-1A	TCLP	100.6	µg/mL	57.1	1746	0.000	14.6
B-NV25-P-1A	TCLP	100.7	µg/mL	50.2	1569	0.000	12.7
B-DC06-P-1A	TCLP	100.0	µg/mL	59.9	2246	0.000	16.5
B-DC06-P-1A	TCLP	101.1	µg/mL	59.0	2224	0.000	16.6
B-DC06-P-1A Post Spike	TCLP	101.1	µg/mL	1.34	16.0	1.01	1.16
Precent Recovery				107%	120%	101%	109%
Spiking Solution			µg/mL	10.0	50.8	10.1	10.1
Precent Recovery				100%	102%	101%	101%
Check Standard			µg/mL	4.90	24.9	1.93	4.98
Precent Recovery				98%	100%	97%	100%
Blank			µg/mL	0.030	0.000	0.000	0.000

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.07	25.3	1.97	5.05
Precent Recovery				101%	101%	99%	101%
Calibration Verification Standard			µg/mL	2.49	12.5	0.99	2.51
Precent Recovery				100%	100%	99%	100%
Quantitation Limit Standard 1			µg/mL	1.02	5.14	0.422	1.04
Precent Recovery				102%	103%	105%	104%
Quantitation Limit Standard 2			µg/mL	0.509	2.59	0.196	0.529
Precent Recovery				102%	104%	98%	106%
Blank			µg/mL	0.009	0.032	0.000	0.001
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.001
B-Wz-A3	TCLP	100.0	µg/mL	0.000	0.000	0.000	0.206
B-Wz-A3	TCLP	100.6	µg/mL	0.000	0.000	0.000	0.242
B-Wz-A2	TCLP	100.5	µg/mL	0.000	0.001	0.000	0.958
B-Wz-A2	TCLP	100.6	µg/mL	0.000	0.000	0.000	1.42
B-Wz-A1	TCLP	101.2	µg/mL	0.000	0.000	0.015	0.297
B-Wz-A1	TCLP	100.6	µg/mL	0.000	0.000	0.000	0.173
B-DC05-Z-1A	TCLP	100.0	µg/mL	3.00	7.82	0.102	0.945
B-DC05-Z-1A	TCLP	100.0	µg/mL	2.99	7.86	0.103	0.943
B-DC06-F-1A	TCLP	100.6	µg/mL	0.206	1.96	0.234	0.147
B-DC06-F-1A	TCLP	100.4	µg/mL	0.200	1.94	0.206	0.128
B-Wz-A3 Post Spike	TCLP	100.0	µg/mL	1.01	4.86	1.04	1.11
Precent Recovery				101%	97%	104%	102%
Spiking Solution			µg/mL	10.3	51.1	10.2	10.2
Precent Recovery				103%	102%	102%	102%
Check Standard			µg/mL	5.11	25.5	2.01	5.06
Precent Recovery				102%	102%	101%	101%
Blank			µg/mL	0.013	0.000	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.002	0.000	0.000	0.002
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.002
Metgod Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.002
B-DC06-T-1D	-200 TM	8.4658	µg/g	47.9	116	85.2	16.3
B-DC06-T-1D	-200 TM	8.2410	µg/g	48.6	123	90.4	16.5
B-DC06-T-1D Pre Spike	-200 TM	8.2559	µg/mL	6.13	12.9	5.27	1.52
Precent Recovery				103%	97%	77%	105%
B-DC06-T-1D Pre Spike	-200 TM	8.1070	µg/mL	5.89	13.0	5.35	1.47
Precent Recovery				98%	101%	84%	100%
B-DC06-T-1D	+30 TM	1.5530	µg/g	570	1713	39.0	70.6
B-DC06-T-1D	+30 TM	1.5530	µg/g	600	1789	41.2	81.8
B-DC06-T-1E	-200 TM	8.1785	µg/g	51.1	123	90.0	16.7
B-DC06-T-1E	-200 TM	8.2328	µg/g	51.2	119	89.3	17.1
B-DC06-T-1E	+30 TM	5.9177	µg/g	149	981	156	24.0
B-DC06-T-1E	+30 TM	5.9177	µg/g	156	1087	172	26.6
B-DC05-Z-AB	+30 TM	0.7394	µg/g	851	5921	18.2	114
B-DC05-Z-AB	+30 TM	0.7394	µg/g	863	6066	6.2	119
B-DC06-T-1D Post Spike	-200 TM	8.4658	µg/mL	3.01	9.84	4.68	1.66

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Precent Recovery				98%	99%	107%	97%
Spiking Solution			µg/mL	10.2	52.3	10.1	10.4
Precent Recovery				102%	105%	101%	104%
Check Standard			µg/mL	5.04	25.6	2.00	5.10
Precent Recovery				101%	103%	100%	102%
Blank			µg/mL	0.030	0.020	0.000	0.007

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.95	24.9	2.02	4.97
Precent Recovery				99%	100%	101%	99%
Calibration Verification Standard			µg/mL	2.64	13.2	1.05	2.64
Precent Recovery				106%	105%	105%	106%
Quantitation Limit Standard 1			µg/mL	1.05	5.27	0.419	1.06
Precent Recovery				105%	105%	105%	106%
Quantitation Limit Standard 2			µg/mL	0.539	2.75	0.207	0.547
Precent Recovery				108%	110%	104%	109%
Blank			µg/mL	0.019	0.078	0.003	0.008
Method Blank (1)	Soil		µg/mL	0.055	0.111	0.068	0.001
Method Blank (2)	Soil		µg/mL	0.000	0.000	0.004	0.000
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.005	0.000
B-NV22-M-1A	-200 TM	8.4331	µg/g	86.6	1655	207	14.7
B-NV22-M-1A	-200 TM	8.0245	µg/g	101	1672	217	15.9
B-NV22-C-1B	-200 TM	7.9915	µg/g	17.5	136	30.0	4.56
B-NV22-C-1B	-200 TM	7.9685	µg/g	16.8	131	30.4	4.43
B-NV22-C-1A	-200 TM	8.4357	µg/g	17.9	128	28.0	4.39
B-NV22-C-1A	-200 TM	7.9888	µg/g	16.7	130	28.0	4.31
B-NV22-K-1B	-200 TM	8.2834	µg/g	40.5	315	47.7	7.84
B-NV22-K-1B	-200 TM	7.9812	µg/g	40.0	315	48.1	7.71
B-NV22-K-1B	+30 TM	10.9691	µg/g	OR	7705	162	OR
B-NV22-K-1B	+30 TM	10.9691	µg/g	OR	9390	183	6072
B-NV22-K-1B	+30 TM	10.9691	µg/g	62229	10457	191	7038
B-NV22-M-1A Post Spike	-200 TM	8.4331	µg/mL	7.41	77.2	10.0	2.46
Precent Recovery				376%	148%	126%	184%
Spiking Solution			µg/mL	11.0	52.1	10.5	10.6
Precent Recovery				110%	104%	105%	106%
Check Standard			µg/mL	5.51	25.8	2.06	5.23
Precent Recovery				110%	103%	103%	105%
Blank			µg/mL	0.489	0.015	0.000	0.075
Method Blank (1)	Soil		µg/mL	5.18	0.164	0.003	0.252
Method Blank (2)	Soil		µg/mL	3.08	0.015	0.004	0.036
Method Blank (3)	Soil		µg/mL	1.84	0.011	0.000	0.022
B-NV16-U-1D	-200 TM	8.1579	µg/g	117	797	82.1	28.6
B-NV16-U-1D	-200 TM	8.0990	µg/g	111	790	81.0	27.9
B-NV16-U-1D	+30 TM	5.8038	µg/g	9377	22030	1477	984
B-NV16-U-1D	+30 TM	5.8038	µg/g	10190	24070	1561	1119
B-NV16-U-1D	+30 TM	5.8038	µg/g	11210	26155	1757	1409
B-NV16-U-1E	-200 TM	8.1536	µg/g	126	763	79.7	29.8
B-NV16-U-1E	-200 TM	8.3889	µg/g	113	763	79.2	27.8
B-NV16-U-1E	+30 TM	10.6750	µg/g	4899	10689	635	500
B-NV16-U-1E	+30 TM	10.6750	µg/g	5395	12384	705	583
B-NV16-U-1E	+30 TM	10.6750	µg/g	6000	13930	783	757
B-NV20-U-1E	-200 TM	7.9888	µg/g	120	734	70.2	30.4
B-NV20-U-1E	-200 TM	7.9400	µg/g	105	742	72.7	27.2
B-NV20-U-1E	+30 TM	13.3550	µg/g	7181	10865	763	766
B-NV20-U-1E	+30 TM	13.3550	µg/g	8326	12804	847	920

Fort Polk Demonstration Project | Jan. 6 | 5/13/97
Project #: G337318-26
Analyst: K. Blann

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
B-NV20-U-1E	+30 TM	13.3550	µg/g	8491	13126	902	1017
B-NV16-U-1D Post Spike	-200 TM	8.1579	µg/g	6.68	36.7	4.32	2.33
Precent Recovery				193%	83%	97%	117%
Spiking Solution			µg/mL	10.4	51.5	10.4	10.5
Precent Recovery				104%	103%	104%	105%
Check Standard			µg/mL	5.04	25.1	2.05	5.10
Precent Recovery				101%	100%	103%	102%
Blank			µg/mL	0.135	0.025	0.003	0.061
100 µg/mL Pb Standard			µg/mL	0.119	96.1	0.000	0.048
Precent Recovery				NA	96%	NA	NA
Spiking Solution			µg/mL	9.76	49.3	9.93	9.94
Precent Recovery				98%	99%	99%	99%
Check Standard			µg/mL	4.87	24.3	2.03	4.95
Precent Recovery				97%	97%	101%	99%
Blank			µg/mL	0.107	0.050	0.007	0.019
Method Blank (1)	TCLP		µg/mL	0.061	0.187	0.028	0.039
Method Blank (2)	TCLP		µg/mL	0.011	0.000	0.034	0.002
Method Blank (3)	TCLP		µg/mL	0.011	0.000	0.000	0.002
B-NV25-U-1L	TCLP	100.6	µg/mL	0.891	1453	13.3	3.75
B-NV25-U-1L	TCLP	100.6	µg/mL	0.885	1428	13.2	3.70
B-NV26-U-1L	TCLP	100.0	µg/mL	0.975	1461	11.6	3.18
B-NV26-U-1L	TCLP	100.0	µg/mL	1.07	1491	11.7	3.24
B-NV25-U-1L Post Spike	TCLP	100.0	µg/mL	1.49	652	7.09	2.71
Precent Recovery				108%	-33%	109%	102%
Spiking Solution			µg/mL	10.2	50.2	10.3	10.2
Precent Recovery				102%	100%	103%	102%
Check Standard			µg/mL	4.99	24.4	2.02	5.00
Precent Recovery				100%	98%	101%	100%
Blank			µg/mL	0.128	0.087	0.002	0.010
100 µg/mL Pb Standard			µg/mL	0.125	97.6	0.000	0.013
Precent Recovery				NA	98%	NA	NA
Spiking Solution			µg/mL	9.95	49.5	10.1	10.1
Precent Recovery				99%	99%	101%	101%
Check Standard			µg/mL	4.95	24.5	2.00	5.02
Precent Recovery				99%	98%	100%	100%
Blank			µg/mL	0.091	0.043	0.003	0.009
B-NV25-U-1L	TCLP	100.6	µg/mL	NA	1586	NA	NA
B-NV25-U-1L	TCLP	100.6	µg/mL	NA	1558	NA	NA
B-NV26-U-1L	TCLP	100.0	µg/mL	NA	1585	NA	NA
B-NV26-U-1L	TCLP	100.0	µg/mL	NA	1604	NA	NA
Spiking Solution			µg/mL	9.87	49.4	9.97	9.98
Precent Recovery				99%	99%	100%	100%
Check Standard			µg/mL	4.93	24.5	2.00	4.99
Precent Recovery				99%	98%	100%	100%
Blank			µg/mL	0.074	0.086	0.004	0.009

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.98	24.9	1.99	5.01
Precent Recovery				100%	100%	100%	100%
Calibration Verification Standard			µg/mL	2.52	13.2	1.01	2.57
Precent Recovery				101%	106%	101%	103%
Quantitation Limit Standard 1			µg/mL	0.99	5.12	0.424	1.04
Precent Recovery				99%	102%	106%	104%
Quantitation Limit Standard 2			µg/mL	0.475	2.58	0.206	0.520
Precent Recovery				95%	103%	103%	104%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.673	0.056	0.000	0.012
Method Blank (2)	Soil		µg/mL	0.414	0.000	0.000	0.000
Method Blank (3)	Soil		µg/mL	0.306	0.000	0.000	0.000
B-NV20-U-1D	-200 TM	8.1688	µg/g	99.5	723	66.3	26.2
B-NV20-U-1D	-200 TM	8.3951	µg/g	101	794	65.5	26.4
B-NV16-U-1D	-200 TM	8.0088	µg/g	109	773	77.9	27.0
B-NV16-U-1D	-200 TM	8.1490	µg/g	109	772	79.6	27.1
B-NV21-U-1D	-200 TM	8.2369	µg/g	87.6	691	67.4	26.9
B-NV21-U-1D	-200 TM	7.9577	µg/g	91.8	692	65.2	27.8
B-NV21-U-1D	+30 TM	6.4705	µg/g	1558	13149	975	178
B-NV21-U-1D	+30 TM	6.4705	µg/g	1647	14163	1029	194
B-NV21-U-1D	+30 TM	6.4705	µg/g	1660	14966	1099	233
B-NV20-U-1D (1)	+30 TM	8.4641	µg/g	8128	13757	1006	812
B-NV20-U-1D (1)	+30 TM	8.4641	µg/g	8814	15158	1070	910
B-NV20-U-1D (1)	+30 TM	8.4641	µg/g	10047	17521	1245	1083
B-NV20-U-1D (2)	+30 TM	5.7306	µg/g	2049	14979	603	224
B-NV20-U-1D (2)	+30 TM	5.7306	µg/g	2143	16248	638	243
B-NV20-U-1D (2)	+30 TM	5.7306	µg/g	2235	17365	685	311
B-NV20-U-1D Post Spike	-200 TM	8.1688	µg/g	5.41	33.5	3.68	2.07
Precent Recovery				135%	79%	98%	100%
Spiking Solution			µg/mL	10.2	49.3	10.0	10.1
Precent Recovery				102%	99%	100%	101%
Check Standard			µg/mL	4.97	24.2	1.96	4.94
Precent Recovery				99%	97%	98%	99%
Blank			µg/mL	0.026	0.000	0.000	0.006

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.86	24.3	1.98	4.88
Precent Recovery				97%	97%	99%	98%
Calibration Verification Standard			µg/mL	2.52	12.7	1.01	2.54
Precent Recovery				101%	101%	101%	102%
Quantitation Limit Standard 1			µg/mL	0.98	5.08	0.413	1.02
Precent Recovery				98%	102%	103%	102%
Quantitation Limit Standard 2			µg/mL	0.483	2.56	0.202	0.517
Precent Recovery				97%	102%	101%	103%
Blank			µg/mL	0.000	0.006	0.001	0.000
Method Blank (1)	Soil		µg/mL	0.402	0.020	0.000	0.004
Method Blank (2)	Soil		µg/mL	0.197	0.000	0.000	0.000
Method Blank (3)	Soil		µg/mL	0.080	0.000	0.000	0.000
B-DC02-F-1A	-200 TM	8.0165	µg/g	83.4	178	93.9	23.7
B-DC02-F-1A	-200 TM	8.2134	µg/g	81.6	173	94.8	23.2
B-DC02-F-1A Pre Spike	-200 TM	8.3729	µg/mL	7.33	15.0	5.45	1.75
Precent Recovery				98%	97%	74%	98%
B-DC02-F-1A Pre Spike	-200 TM	8.2702	µg/mL	7.30	15.0	5.38	1.77
Precent Recovery				98%	98%	73%	101%
B-DC02-F-1A	+30 TM	1.6436	µg/g	94.8	530	48.9	32.3
B-DC02-F-1A	+30 TM	1.6436	µg/g	79.6	537	63.1	46.8
B-DC02-F-1A	+30 TM	1.6436	µg/g	NA	129	NA	301
B-NV22-U-1E	-200 TM	8.0300	µg/g	85.6	589	54.9	25.8
B-NV22-U-1E	-200 TM	8.0414	µg/g	95.0	603	57.9	26.7
B-NV22-U-1E	+30 TM	10.0932	µg/g	4110	7565	343	422
B-NV22-U-1E	+30 TM	10.0932	µg/g	4431	8452	372	473
B-NV22-U-1E	+30 TM	10.0932	µg/g	4668	9025	392	538
B-NV26-U-1E	+30 TM	3.6833	µg/g	10415	15606	1349	746
B-NV26-U-1E	+30 TM	3.6833	µg/g	11077	16540	1417	804
B-NV26-U-1E	+30 TM	3.6833	µg/g	11148	16659	1510	909
B-DC02-F-1A Post Spike	-200 TM	8.0165	µg/mL	4.87	11.8	4.68	1.93
Precent Recovery				153%	92%	91%	98%
Spiking Solution			µg/mL	10.1	50.8	10.1	10.2
Precent Recovery				101%	102%	101%	102%
Check Standard			µg/mL	4.98	25.1	2.00	5.05
Precent Recovery				100%	101%	100%	101%
Blank			µg/mL	0.015	0.000	0.000	0.031

ample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL				
:heck Standard			µg/mL	4.93	24.9	2.01	4.99
'recent Recovery				99%	100%	101%	100%
:alibration Verification Standard			µg/mL	2.51	12.7	1.02	2.50
'recent Recovery				100%	101%	102%	100%
ɩuantitation Limit Standard 1			µg/mL	1.00	5.13	0.422	0.97
'recent Recovery				100%	103%	106%	97%
ɩuantitation Limit Standard 2			µg/mL	0.560	2.95	0.218	0.527
'recent Recovery				112%	118%	109%	105%
;lank			µg/mL	0.002	0.034	0.000	0.000
/lethod Blank	Soil		µg/mL	0.266	0.027	0.010	0.046
;-NV22-U-1D	-200 TM	8.0993	µg/g	84.9	609	60.1	23.8
;-NV22-U-1D	-200 TM	8.2865	µg/g	86.1	600	59.0	23.7
;-NV22-U-1D Pre Spike	-200 TM	7.9968	µg/mL	7.62	33.1	4.14	1.79
'recent Recovery				104%	114%	89%	105%
;-NV22-U-1D Pre Spike	-200 TM	8.0526	µg/mL	7.58	33.0	4.01	1.79
'recent Recovery				103%	110%	82%	104%
;-NV22-U-1D	+30 TM	10.2121	µg/g	6524	12769	638	649
;-NV22-U-1D	+30 TM	10.2121	µg/g	7113	14277	695	731
;-NV22-U-1D	+30 TM	10.2121	µg/g	7655	15491	745	745
;-NV22-C-1B (1)	+30 TM	8.2240	µg/g	48.5	273	12.7	17.0
;-NV22-C-1B (1)	+30 TM	8.2240	µg/g	28.3	318	13.1	8.57
;-NV22-C-1B (1)	+30 TM	8.2240	µg/g	NA	350	20.1	NA
;-NV22-C-1B (2)	+30 TM	8.0771	µg/g	36.7	1093	132	14.8
;-NV22-C-1B (2)	+30 TM	8.0771	µg/g	32.0	1259	145	7.81
;-NV22-C-1B (2)	+30 TM	8.0771	µg/g	NA	1455	155	NA
;-NV22-C-1B (3)	+30 TM	8.1550	µg/g	31.2	220	9.09	12.4
;-NV22-C-1B (3)	+30 TM	8.1550	µg/g	26.5	250	9.14	5.41
;-NV22-C-1B (3)	+30 TM	8.1550	µg/g	NA	238	NA	NA
;-NV22-C-1B (4)	+30 TM	6.0331	µg/g	OR	365	20.1	3965
;-NV22-C-1B (4)	+30 TM	6.0331	µg/g	43212	405	18.7	4759
;-NV22-C-1B (4)	+30 TM	6.0331	µg/g	50372	397	3.32	5539
;-NV21-U-1E (1)	+30 TM	8.1162	µg/g	538	2464	276	68.8
3-NV21-U-1E (1)	+30 TM	8.1162	µg/g	516	2791	296	56.9
3-NV21-U-1E (1)	+30 TM	8.1162	µg/g	684	3254	322	NA
3-NV21-U-1E (2)	+30 TM	8.2362	µg/g	2111	9177	484	228
3-NV21-U-1E (2)	+30 TM	8.2362	µg/g	2244	10206	529	244
3-NV21-U-1E (2)	+30 TM	8.2362	µg/g	2472	11471	591	186
3-NV22-U-1D Post Spike	-200 TM	8.0993	µg/mL	5.33	30.8	3.53	2.06
'recent Recovery				190%	122%	110%	109%
;piking Solution			µg/mL	10.7	52.9	10.6	10.6
'recent Recovery				107%	106%	106%	106%
:heck Standard			µg/mL	5.25	25.9	2.05	5.15
'recent Recovery				105%	103%	103%	103%
3lank			µg/mL	0.170	0.000	0.000	0.000

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.03	25.2	2.03	5.04
Precent Recovery				101%	101%	102%	101%
Calibration Verification Standard			µg/mL	2.45	12.7	1.02	2.56
Precent Recovery				98%	101%	102%	102%
Quantitation Limit Standard 1			µg/mL	0.89	5.10	0.422	1.03
Precent Recovery				89%	102%	105%	103%
Quantitation Limit Standard 2			µg/mL	0.375	2.55	0.217	0.512
Precent Recovery				75%	102%	109%	102%
Blank			µg/mL	0.000	0.022	0.000	0.001
Method Blank	Soil		µg/mL	1.34	0.042	0.000	0.008
B-NV21-U-1E	-200 TM	8.1858	µg/g	92.7	599	62.8	27.8
B-NV21-U-1E	-200 TM	8.0984	µg/g	92.3	605	62.5	28.2
B-NV22-M-1A (1)	+30 TM	8.0816	µg/g	456	1158	86.8	53.6
B-NV22-M-1A (1)	+30 TM	8.0816	µg/g	457	1197	89.5	55.1
B-NV22-M-1A (1)	+30 TM	8.0816	µg/g	324	1256	88.7	52.8
B-NV22-M-1A (2)	+30 TM	8.0256	µg/g	381	383	23.0	43.4
B-NV22-M-1A (2)	+30 TM	8.0256	µg/g	383	401	23.5	44.5
B-NV22-M-1A (2)	+30 TM	8.0256	µg/g	255	384	25.4	37.6
B-NV22-M-1A (3)	+30 TM	8.0877	µg/g	105	689	41.0	13.7
B-NV22-M-1A (3)	+30 TM	8.0877	µg/g	91.9	721	42.7	12.8
B-NV22-M-1A (3)	+30 TM	8.0877	µg/g	NA	716	37.8	5.6
B-NV22-M-1A (4)	+30 TM	8.0376	µg/g	271	2005	211	33.0
B-NV22-M-1A (4)	+30 TM	8.0376	µg/g	270	2134	222	33.5
B-NV22-M-1A (4)	+30 TM	8.0376	µg/g	121	2238	245	23.4
B-NV22-M-1A (5)	+30 TM	5.9463	µg/g	222	257	21.3	25.5
B-NV22-M-1A (5)	+30 TM	5.9463	µg/g	210	264	22.8	24.5
B-NV22-M-1A (5)	+30 TM	5.9463	µg/g	NA	169	16.6	7.2
B-DC03-U-1D	+30 TM	2.2020	µg/g	24723	34314	2009	2529
B-DC03-U-1D	+30 TM	2.2020	µg/g	26530	36294	2103	2734
B-DC03-U-1D	+30 TM	2.2020	µg/g	28851	39968	2274	3022
B-DC04-U-1D	-200 TM	8.0541	µg/g	104	494	52.2	27.4
B-DC04-U-1D	-200 TM	8.4252	µg/g	88.1	484	52.4	25.2
B-DC04-U-1D	+30 TM	4.7640	µg/g	12922	25197	1283	1319
B-DC04-U-1D	+30 TM	4.7640	µg/g	14051	27141	1374	1453
B-DC04-U-1D	+30 TM	4.7640	µg/g	15065	29681	1465	1594
B-NV21-U-1E Post Spike	-200 TM	8.1858	µg/g	5.40	29.1	3.46	2.21
Precent Recovery				160%	91%	89%	108%
Spiking Solution			µg/mL	10.5	50.3	10.2	10.3
Precent Recovery				105%	101%	102%	103%
Check Standard			µg/mL	5.12	24.6	2.00	5.05
Precent Recovery				102%	99%	100%	101%
Blank			µg/mL	0.053	0.006	0.012	0.000

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.98	25.0	2.00	4.97
Precent Recovery				100%	100%	100%	99%
Calibration Verification Standard			µg/mL	2.52	12.7	1.01	2.54
Precent Recovery				101%	101%	101%	102%
Quantitation Limit Standard 1			µg/mL	1.01	5.18	0.413	1.04
Precent Recovery				101%	104%	103%	104%
Quantitation Limit Standard 2			µg/mL	0.497	2.67	0.207	0.523
Precent Recovery				99%	107%	104%	105%
Blank			µg/mL	0.000	0.000	0.026	0.000
Method Blank	Soil		µg/mL	0.129	0.015	0.001	0.009
B-NV22-K-1A	-200 TM	8.3142	µg/g	35.4	299	44.5	7.03
B-NV22-K-1A	-200 TM	8.2285	µg/g	38.3	308	45.1	7.44
B-NV22-K-1A Pre Spike	-200 TM	8.2590	µg/mL	5.46	20.5	3.23	1.10
Precent Recovery				97%	97%	68%	99%
B-NV22-K-1A Pre Spike	-200 TM	8.3256	µg/mL	5.50	20.8	3.16	1.14
Precent Recovery				98%	100%	64%	103%
B-NV22-K-1A (1)	+30 TM	8.0565	µg/g	67.1	346	10.5	27.1
B-NV22-K-1A (1)	+30 TM	8.0565	µg/g	66.2	389	11.8	31.8
B-NV22-K-1A (1)	+30 TM	8.0565	µg/g	34.3	371	11.4	52.8
B-NV22-K-1A (2)	+30 TM	8.1529	µg/g	342	3312	356	49.5
B-NV22-K-1A (2)	+30 TM	8.1529	µg/g	369	3867	392	56.0
B-NV22-K-1A (2)	+30 TM	8.1529	µg/g	374	4320	440	72.2
B-NV22-K-1A (3)	+30 TM	6.3253	µg/g	70.6	402	12.8	17.2
B-NV22-K-1A (3)	+30 TM	6.3253	µg/g	69.9	450	13.5	17.7
B-NV22-K-1A (3)	+30 TM	6.3253	µg/g	26.1	391	41.6	25.5
B-NV22-C-1A (1)	+30 TM	8.0209	µg/g	159	229	0.972	28.1
B-NV22-C-1A (1)	+30 TM	8.0209	µg/g	170	269	0.224	31.6
B-NV22-C-1A (1)	+30 TM	8.0209	µg/g	148	236	NA	33.3
B-NV22-C-1A (2)	+30 TM	8.1285	µg/g	32.2	230	4.93	17.0
B-NV22-C-1A (2)	+30 TM	8.1285	µg/g	30.9	268	4.92	18.3
B-NV22-C-1A (2)	+30 TM	8.1285	µg/g	NA	218	12.1	13.3
B-NV22-C-1A (3)	+30 TM	5.7570	µg/g	342	191	3.61	44.4
B-NV22-C-1A (3)	+30 TM	5.7570	µg/g	364	207	5.63	48.1
B-NV22-C-1A (3)	+30 TM	5.7570	µg/g	331	138	15.5	52.8
B-DC05-C-1A	-200 TM	8.3496	µg/g	31.1	192	30.4	6.18
B-NV22-K-1A Post Spike	-200 TM	8.3142	µg/mL	2.46	17.4	2.82	1.27
Precent Recovery				99%	100%	97%	98%
Spiking Solution			µg/mL	10.1	51.0	10.0	10.2
Precent Recovery				101%	102%	100%	102%
Check Standard			µg/mL	4.92	25.1	2.00	5.00
Precent Recovery				98%	100%	100%	100%
Blank			µg/mL	0.000	0.000	0.001	0.000

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.99	24.9	2.02	5.01
Precent Recovery				100%	100%	101%	100%
Calibration Verification Standard			µg/mL	2.54	12.7	1.03	2.57
Precent Recovery				102%	101%	103%	103%
Quantitation Limit Standard 1			µg/mL	1.02	5.17	0.412	1.05
Precent Recovery				102%	103%	103%	105%
Quantitation Limit Standard 2			µg/mL	0.512	2.60	0.233	0.529
Precent Recovery				102%	104%	116%	106%
Check Standard			µg/mL	5.03	25.3	2.02	5.06
Precent Recovery				101%	101%	101%	101%
Method Blank	Soil		µg/mL	0.174	0.096	0.005	0.014
B-NV26-U-1D	-200 TM	8.7154	µg/g	103	696	62.4	26.6
B-NV26-U-1D	-200 TM	7.8878	µg/g	100	700	63.7	26.2
B-NV26-U-1D Pre Spike	-200 TM	8.5182	µg/mL	8.16	37.4	4.13	1.91
Precent Recovery				97%	95%	71%	99%
B-NV26-U-1D Pre Spike	-200 TM	8.1196	µg/mL	8.24	36.5	4.23	1.90
Precent Recovery				104%	101%	82%	105%
B-NV26-U-1D	+30 TM	4.5068	µg/g	9741	34046	1491	1027
B-NV26-U-1D	+30 TM	4.5068	µg/g	10245	35813	1610	1108
B-NV26-U-1D	+30 TM	4.5068	µg/g	11421	39096	1731	1254
B-NV26-U-1E	-200 TM	8.1255	µg/g	166	756	63.5	32.2
B-NV26-U-1E	-200 TM	8.0095	µg/g	107	744	62.8	25.9
B-DC04-U-1E	+30 TM	5.3882	µg/g	10775	12345	828	1109
B-DC04-U-1E	+30 TM	5.3882	µg/g	11835	13587	898	1242
B-DC04-U-1E	+30 TM	5.3882	µg/g	13431	15430	1027	1440
B-DC04-U-1E	-200 TM	7.9537	µg/g	97.1	470	51.4	23.6
B-DC04-U-1E	-200 TM	8.3582	µg/g	83.9	503	55.2	22.6
B-DC03-U-1E	+30 TM	0.3124	µg/g	48329	293598	22772	5090
B-DC03-U-1E	+30 TM	0.3124	µg/g	51248	304481	24203	5394
B-DC03-U-1E	+30 TM	0.3124	µg/g	56114	332266	26917	6591
B-NV26-U-1D Post Spike	-200 TM	8.7154	µg/mL	5.79	34.6	3.78	2.14
Precent Recovery				130%	86%	106%	98%
Spiking Solution			µg/mL	10.2	50.3	10.1	10.2
Precent Recovery				102%	101%	101%	102%
Check Standard			µg/mL	5.01	24.8	2.04	5.04
Precent Recovery				100%	99%	102%	101%
Blank			µg/mL	0.064	0.000	0.007	0.003

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.00	25.1	2.00	5.00
Precent Recovery				100%	100%	100%	100%
Calibration Verification Standard			µg/mL	2.39	12.7	1.03	2.53
Precent Recovery				96%	102%	103%	101%
Quantitation Limit Standard 1			µg/mL	0.83	5.08	0.426	1.01
Precent Recovery				83%	102%	106%	101%
Quantitation Limit Standard 2			µg/mL	0.309	2.56	0.193	0.502
Precent Recovery				62%	102%	96%	100%
Method Blank	Soil		µg/mL	0.000	0.000	0.000	0.000
Check Standard			µg/mL	4.97	24.9	1.98	5.01
Precent Recovery				99%	99%	99%	100%
Calibration Verification Standard			µg/mL	2.49	12.6	1.00	2.51
Precent Recovery				99%	100%	100%	100%
Quantitation Limit Standard 1			µg/mL	0.94	5.06	0.410	1.02
Precent Recovery				94%	101%	103%	102%
Quantitation Limit Standard 2			µg/mL	0.426	2.55	0.215	0.524
Precent Recovery				85%	102%	107%	105%
Blank			µg/mL	0.000	0.000	0.000	0.000
Method Blank	Soil		µg/mL	0.8654	0.0281	0.0045	0.0105
3-NV25-U-1D	-200 TM	8.2790	µg/g	164	892	83.4	33.6
3-NV25-U-1D	-200 TM	8.1138	µg/g	104	898	81.0	27.8
3-NV25-U-1D (1)	+30 TM	8.0520	µg/g	8150	8539	605	831
3-NV25-U-1D (1)	+30 TM	8.0520	µg/g	8864	9621	662	946
3-NV25-U-1D (1)	+30 TM	8.0520	µg/g	9686	10681	713	1088
3-NV25-U-1D (2)	+30 TM	8.0363	µg/g	4855	16224	837	493
3-NV25-U-1D (2)	+30 TM	8.0363	µg/g	5096	17645	885	538
3-NV25-U-1D (2)	+30 TM	8.0363	µg/g	5565	19586	978	632
3-NV25-U-1D (3)	+30 TM	7.4530	µg/g	3609	10224	353	384
3-NV25-U-1D (3)	+30 TM	7.4530	µg/g	3867	11488	379	429
3-NV25-U-1D (3)	+30 TM	7.4530	µg/g	4209	12941	421	485
3-NV25-U-1E	-200 TM	8.3223	µg/g	114	870	76.5	28.9
3-NV25-U-1E	-200 TM	8.1568	µg/g	162	866	77.0	33.3
3-NV25-U-1E (1)	+30 TM	8.0666	µg/g	2123	10753	549	208
3-NV25-U-1E (1)	+30 TM	8.0666	µg/g	2264	11988	597	228
3-NV25-U-1E (1)	+30 TM	8.0666	µg/g	2360	13128	624	228
3-NV25-U-1E (2)	+30 TM	6.9691	µg/g	5513	18355	517	593
3-NV25-U-1E (2)	+30 TM	6.9691	µg/g	5919	20146	558	655
3-NV25-U-1E (2)	+30 TM	6.9691	µg/g	6632	22958	630	732
3-DC05-K-1A (1)	+30 TM	6.0906	µg/g	OVR	14603	891	OVR
3-DC05-K-1A (1)	+30 TM	6.0906	µg/g	52261	16928	1071	6704
3-DC05-K-1A (1)	+30 TM	6.0906	µg/g	60011	19194	1164	7889
3-DC05-K-1A (2)	+30 TM	6.2862	µg/g	12539	20063	1857	1297
3-DC05-K-1A (2)	+30 TM	6.2862	µg/g	15478	22287	2039	1464
3-DC05-K-1A (2)	+30 TM	6.2862	µg/g	15405	24466	2191	1613
3-NV25-U-1D Post Spike	-200 TM	8.2790	µg/mL	8.88	41.7	4.52	2.58
Precent Recovery				207%	97%	107%	119%
Spiking Solution			µg/mL	10.7	51.2	10.2	10.4

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Precent Recovery				107%	102%	102%	104%
Check Standard			µg/mL	5.22	25.1	2.04	5.08
Precent Recovery				104%	100%	102%	102%
Blank			µg/mL	0.178	0.000	0.002	0.000

ample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL				
heck Standard			µg/mL	4.98	25.0	2.00	4.99
recent Recovery				100%	100%	100%	100%
alibration Verification Standard			µg/mL	2.50	12.8	1.02	2.57
recent Recovery				100%	102%	102%	103%
uantitation Limit Standard 1			µg/mL	0.96	5.25	0.414	1.05
recent Recovery				96%	105%	104%	105%
uantitation Limit Standard 2			µg/mL	0.428	2.61	0.219	0.522
recent Recovery				86%	104%	110%	104%
lank			µg/mL	0.000	0.001	0.000	0.000
lethod Blank	Soil		µg/mL	1.80	0.143	0.001	0.020
-DC03-U-1E	-200 TM	8.3474	µg/g	77.7	557	51.7	20.6
-DC03-U-1E	-200 TM	8.2228	µg/g	84.7	557	54.3	21.1
-DC03-U-1E Pre Spike	-200 TM	8.1628	µg/mL	7.22	30.6	3.75	1.66
recent Recovery				94%	98%	77%	100%
-DC03-U-1E Pre Spike	-200 TM	7.9892	µg/mL	7.33	30.0	3.69	1.66
recent Recovery				99%	97%	76%	101%
-DC03-U-1D	-200 TM	7.9536	µg/g	80.7	497	47.7	21.1
-DC03-U-1D	-200 TM	7.9180	µg/g	76.2	496	47.7	20.0
-DC03-FB-1A	-200 TM	8.3102	µg/g	6.17	4.67	0.631	6.19
-DC03-FB-1A	-200 TM	8.0845	µg/g	6.35	5.66	1.28	6.22
-DC05-C-1A (1)	+30 TM	8.1231	µg/g	37.7	367	24.2	18.6
-DC05-C-1A (1)	+30 TM	8.1231	µg/g	28.2	428	30.2	19.8
-DC05-C-1A (1)	+30 TM	8.1231	µg/g	NA	338	55.0	11.2
-DC05-C-1A (2)	+30 TM	8.1425	µg/g	8044	3210	111	812
-DC05-C-1A (2)	+30 TM	8.1425	µg/g	9057	3897	127	972
-DC05-C-1A (2)	+30 TM	8.1425	µg/g	10532	4601	126	1171
-DC05-C-1A (3)	+30 TM	2.7035	µg/g	311	9913	478	37.1
-DC05-C-1A (3)	+30 TM	2.7035	µg/g	252	10708	507	26.9
-DC05-C-1A (3)	+30 TM	2.7035	µg/g	NA	11507	639	39.2
-DC03-U-1E Post Spike	-200 TM	8.3474	µg/mL	4.26	28.4	3.22	1.92
recent Recovery				102%	102%	106%	106%
piking Solution			µg/mL	10.1	52.2	10.1	10.3
recent Recovery				101%	104%	101%	103%
Check Standard			µg/mL	5.02	25.4	2.02	5.08
recent Recovery				100%	102%	101%	102%
Blank			µg/mL	0.000	0.000	0.001	0.000
Method Blank	Soil		µg/mL	0.550	0.065	0.000	0.026
3-WZ-A3	-200 TM	8.0511	µg/g	32.0	23.3	0.676	129
3-WZ-A3	-200 TM	8.3222	µg/g	25.8	19.1	0.601	111
3-WZ-A3	-200 TM	8.2655	µg/g	24.9	17.5	0.854	114
3-WZ-A3	-200 TM	8.0966	µg/g	26.1	18.5	0.865	114
3-WZ-A3	+30 TM	8.4521	µg/g	3.48	3.26	0.114	49.0
3-WZ-A3	+30 TM	8.4521	µg/g	NA	NA	NA	57.6
3-WZ-A3	+30 TM	8.4521	µg/g	NA	NA	NA	83.6
3-WZ-A2	-200 TM	8.2898	µg/g	19.6	40.0	0.789	139
3-WZ-A2	-200 TM	8.0864	µg/g	16.6	39.0	1.37	141
3-WZ-A2	+30 TM	8.4909	µg/g	1.51	3.63	NA	33.5

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
B-WZ-A2	+30 TM	8.4909	µg/g	NA	NA	NA	35.1
B-WZ-A2	+30 TM	8.4909	µg/g	NA	NA	NA	41.7
B-WZ-A1	+8 TM	8.1279	µg/g	1.23	0.364	NA	28.3
B-WZ-A1	+8 TM	8.1279	µg/g	NA	NA	NA	29.9
B-WZ-A1	+8 TM	8.1279	µg/g	NA	NA	NA	30.4
B-WZ-A1	-200 TM	8.3355	µg/g	13.3	9.76	1.80	119
B-WZ-A1	-200 TM	8.3774	µg/g	12.4	10.2	1.16	122
B-WZ-A3 Post Spike	-200 TM	8.0511	µg/mL	1.94	4.96	0.906	5.418
Precent Recovery				65%	80%	88%	21%
Spiking Solution			µg/mL	10.3	52.5	10.2	10.4
Precent Recovery				103%	105%	102%	104%
Check Standard			µg/mL	4.51	23.2	1.84	4.66
Precent Recovery				90%	93%	92%	93%
Blank			µg/mL	0.000	0.000	0.028	0.000
Method Blank	Soil		µg/mL	0.232	0.000	0.001	0.015
B-DC05-K-1A	-200 TM	7.9619	µg/g	48.4	978	83.9	8.80
B-DC05-K-1A	-200 TM	7.9903	µg/g	39.3	977	83.1	9.68
B-DC05-K-1A	-200 TM	8.0577	µg/g	57.6	965	82.4	9.60
B-DC05-K-1A	-200 TM	8.3371	µg/g	34.8	976	88.6	7.33
B-DC05-K-1B	-200 TM	8.2309	µg/g	53.9	1028	89.9	8.45
B-DC05-K-1B	-200 TM	8.0023	µg/g	56.1	1022	88.3	8.80
B-DC03-FB-1A	+30 TM	8.1573	µg/g	0.841	185	18.6	10.1
B-DC03-FB-1A	+30 TM	8.0174	µg/g	0.556	2.68	0.030	10.2
B-DC03-FB-1A	+30 TM	3.7920	µg/g	NA	268	28.9	9.61
B-DC03-FB-1A	+30 TM	3.7920	µg/g	NA	285	35.7	7.73
B-DC03-FB-1A	+30 TM	3.7920	µg/g	NA	15.3	16.9	10.5
B-DC05-C-1B (1)	+30 TM	8.0629	µg/g	OVR	1288	140	1706
B-DC05-C-1B (1)	+30 TM	8.0629	µg/g	17078	1463	167	1984
B-DC05-C-1B (1)	+30 TM	8.0629	µg/g	20290	1685	204	2409
B-DC05-C-1B (2)	+30 TM	5.4902	µg/g	4499	1897	178	488
B-DC05-C-1B (2)	+30 TM	5.4902	µg/g	4969	2184	201	553
B-DC05-C-1B (2)	+30 TM	5.4902	µg/g	5579	2295	244	651
B-DC05-K-1A Post Spike	-200 TM	7.9619	µg/mL	4.00	48.1	4.62	1.51
Precent Recovery				207%	184%	128%	116%
Spiking Solution			µg/mL	9.27	48.7	9.41	9.56
Precent Recovery				93%	97%	94%	96%
Check Standard			µg/mL	4.57	23.5	1.84	4.70
Precent Recovery				91%	94%	92%	94%
Blank			µg/mL	0.035	0.000	0.007	0.018
Method Blank	Soil		µg/mL	0.763	0.033	0.008	0.062
B-DC06-P-1A	-200 TM	8.0021	µg/g	6261	16243	404	1072
B-DC06-P-1A	-200 TM	8.3300	µg/g	6341	14742	406	1078
B-DC06-P-1A	+30 TM	10.7377	µg/g	10047	11027	549	1632
B-DC06-P-1A	+30 TM	10.7377	µg/g	11623	13560	646	2042
B-DC06-P-1A	+30 TM	10.7377	µg/g	13755	15916	781	2499
B-NV25-P-1A	-200 TM	8.1744	µg/g	4245	16667	312	688
B-NV25-P-1A	-200 TM	8.2715	µg/g	4275	16019	306	690
B-NV25-P-1A	+30 TM	0.9130	µg/g	4576	69726	331	752

Fort Polk Demonstration Project
Project #: G337318-26
Analyst: K. Blann

Jan. 23

5/13/97

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
B-NV25-P-1A	+30 TM	0.9130	µg/g	4854	75268	359	801
B-NV25-P-1A	+30 TM	0.9130	µg/g	5702	84272	698	1195
B-DC12-T-1E	-200 TM	8.1934	µg/g	88.5	543	74.9	22.7
B-DC12-T-1E	-200 TM	8.1688	µg/g	83.8	539	74.8	21.5
B-DC12-T-1E	+30 TM	5.1693	µg/g	4879	26464	1051	517
B-DC12-T-1E	+30 TM	5.1693	µg/g	5297	28921	1127	567
B-DC12-T-1E	+30 TM	5.1693	µg/g	6028	32616	1236	660
B-DC12-T-1D	-200 TM	8.5793	µg/g	94.4	623	74.7	24.9
B-DC12-T-1D	-200 TM	7.8631	µg/g	89.0	614	77.3	23.5
B-DC06-P-1A Post Spike	-200 TM	8.0021	µg/mL	273.1	699.9	18.8	46.82
Precent Recovery				2260%	1000%	263%	393%
Spiking Solution			µg/mL	10.98	54.1	10.31	10.57
Precent Recovery				110%	108%	103%	106%
Check Standard			µg/mL	5.26	25.8	2.04	5.15
Precent Recovery				105%	103%	102%	103%
Blank			µg/mL	0.199	0.008	0.012	0.026
B-DC06-P-1A	-200 TM	8.0021	µg/g	7314	19045	477	1298
B-DC06-P-1A	-200 TM	8.0021	µg/g	8656	22544	567	1566
B-DC06-P-1A	-200 TM	8.3300	µg/g	7491	17527	473	1322
B-DC06-P-1A	-200 TM	8.3300	µg/g	8819	20804	557	1587
Spiking Solution			µg/mL	10.3	52.3	10.0	10.3
Precent Recovery				103%	105%	100%	103%
Check Standard			µg/mL	5.19	25.5	2.03	5.10
Precent Recovery				104%	102%	102%	102%
Blank			µg/mL	0.185	0.013	0.013	0.041

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Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.99	25.0	2.02	4.99
Precent Recovery				100%	100%	101%	100%
Calibration Verification Standard			µg/mL	2.45	12.5	1.01	2.51
Precent Recovery				98%	100%	101%	100%
Quantitation Limit Standard 1			µg/mL	0.94	5.06	0.412	1.01
Precent Recovery				94%	101%	103%	101%
Quantitation Limit Standard 2			µg/mL	0.421	2.53	0.214	0.497
Precent Recovery				84%	101%	107%	99%
Blank			µg/mL	0.004	0.000	0.001	0.000
Method Blank	Soil		µg/mL	1.49	0.171	0.000	0.030
B-DC06-L-1A	-200 TM	8.0754	µg/g	107	410	149	29.1
B-DC06-L-1A	-200 TM	8.0448	µg/g	105	399	151	29.1
B-DC06-L-1A Pre Spike	-200 TM	8.3162	µg/mL	8.39	24.7	8.14	2.00
Precent Recovery				100%	101%	94%	99%
B-DC06-L-1A Pre Spike	-200 TM	8.0206	µg/mL	8.08	23.7	7.78	1.94
Precent Recovery				97%	96%	87%	96%
B-DC06-F-1A	-200 TM	8.0266	µg/g	118	146	105	26.6
B-DC06-F-1A	-200 TM	8.3384	µg/g	59	155	105	14.8
B-DC02-L-1A	-200 TM	7.9417	µg/g	101	432	156	26.9
B-DC02-L-1A	-200 TM	7.9856	µg/g	98.9	425	153	27.5
B-DC02-L-1A	+30 TM	7.3109	µg/g	125	350	181	41.1
B-DC02-L-1A	+30 TM	7.3109	µg/g	121	384	195	42.7
B-DC02-L-1A	+30 TM	7.3109	µg/g	4.92	349	237	27.9
B-DC06-L-1A	+30 TM	5.8082	µg/g	148	442	197	42.6
B-DC06-L-1A	+30 TM	5.8082	µg/g	145	488	215	43.2
B-DC06-L-1A	+30 TM	5.8082	µg/g	NA	428	249	19.5
B-DC12-T-1D	+30 TM	2.5344	µg/g	20391	34635	2164	2210
B-DC12-T-1D	+30 TM	2.5344	µg/g	21697	36273	2251	2362
B-DC12-T-1D	+30 TM	2.5344	µg/g	24858	40325	2487	2615
B-DC06-L-1A Post Spike	-200 TM	8.0754	µg/mL	5.92	21.0	6.97	2.18
Precent Recovery				161%	89%	96%	100%
Spiking Solution			µg/mL	10.2	51.5	10.2	10.2
Precent Recovery				102%	103%	102%	102%
Check Standard			µg/mL	5.10	25.1	2.00	5.02
Precent Recovery				102%	100%	100%	100%
Blank			µg/mL	0.128	0.000	0.000	0.000

Fort Polk Demonstration Project
Project #: G337318-26
Analyst: K. Blann

Jan. 27

5/13/97

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.00	25.0	2.05	4.98
Precent Recovery				100%	100%	102%	100%
Calibration Verification Standard			µg/mL	2.46	12.6	1.03	2.48
Precent Recovery				99%	101%	103%	99%
Quantitation Limit Standard 1			µg/mL	0.91	5.05	0.404	0.94
Precent Recovery				91%	101%	101%	94%
Quantitation Limit Standard 2			µg/mL	0.393	2.52	0.211	0.420
Precent Recovery				79%	101%	106%	84%
Blank			µg/mL	0.000	0.001	0.000	0.000
Method Blank (1)	Soil		µg/mL	0.775	0.091	0.005	0.061
Method Blank (2)	Soil		µg/mL	0.564	0.046	0.000	0.000
3-DC05-C-1A	-200 TM	8.1259	µg/g	32.8	185	31.0	3.95
3-DC05-C-1B	-200 TM	8.1425	µg/g	21.0	184	31.0	2.86
3-DC05-C-1B	-200 TM	8.0211	µg/g	18.1	186	31.3	2.36
3-DC05-K-1B	+30 TM	9.8202	µg/g	OVR	12751	1532	1577
3-DC05-K-1B	+30 TM	9.8202	µg/g	17647	14928	1705	1899
3-DC05-K-1B	+30 TM	9.8202	µg/g	19572	16710	1866	2090
3-DC05-C-1A Post Spike	-200 TM	8.1259	µg/mL	2.45	12.6	2.29	1.17
Precent Recovery				112%	102%	103%	101%
Spiking Solution			µg/mL	10.3	52.1	10.4	10.4
Precent Recovery				103%	104%	104%	104%
Check Standard			µg/mL	5.09	25.6	2.07	5.08
Precent Recovery				102%	103%	104%	102%
Blank			µg/mL	0.000	0.013	0.003	0.000
3-DC05-K-1B	+30 TM	9.8202	µg/g	18309	16364	1822	1003

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
Instrument Detection Limit			µg/mL				
Check Standard			µg/mL	4.95	24.8	1.96	4.95
Precent Recovery				99%	99%	98%	99%
Calibration Verification Standard			µg/mL	2.53	12.6	1.00	2.52
Precent Recovery				101%	101%	100%	101%
Quantitation Limit Standard 1			µg/mL	1.01	4.95	0.406	1.00
Precent Recovery				101%	99%	102%	100%
Quantitation Limit Standard 2			µg/mL	0.497	2.45	0.194	0.491
Precent Recovery				99%	98%	97%	98%
Blank			µg/mL	0.000	0.000	0.011	0.000
Method Blank	Organic		µg/mL	0.021	0.000	0.000	0.003
Method Blank	Organic		µg/mL	0.024	0.000	0.008	0.000
Method Blank	Organic		µg/mL	0.006	0.000	0.000	0.000
B-DC05-Z-1B	-200 TM	2.0150	µg/g	2030	10640	45.6	193
B-DC05-Z-1B	-200 TM	2.0150	µg/g	2127	11231	49.0	198
B-DC05-Z-1B	-200 TM	2.0589	µg/g	1811	9565	42.7	173
B-DC05-Z-1B	-200 TM	2.0589	µg/g	1946	10374	43.2	181
B-DC05-Z-1B	-200 TM	2.0589	µg/g	1665	10593	48.6	119
B-DC05-Z-1B	-200 TM	2.0004	µg/g	2017	10148	43.9	199
B-DC05-Z-1B	-200 TM	2.0004	µg/g	2115	10738	49.1	203
B-DC05-Z-1B	-200 TM	2.0004	µg/g	1865	10988	35.5	148
B-DC05-Z-1B	-200 TM	2.0016	µg/g	2035	10542	45.1	194
B-DC05-Z-1B	-200 TM	2.0016	µg/g	2175	11351	50.7	203
B-DC05-Z-1B	-200 TM	2.0016	µg/g	1928	11641	56.5	138
B-DC05-Z-1B Pre Spike	-200 TM	2.0065	µg/mL	23.5	111	2.09	2.64
Precent Recovery				77%	54%	81%	88%
B-DC05-Z-1B Pre Spike	-200 TM	2.0065	µg/mL	4.99	23.7	0.441	0.551
Precent Recovery				114%	148%	87%	102%
B-DC05-Z-1B Pre Spike	-200 TM	2.0065	µg/mL	0.459	2.50	0.048	0.046
Precent Recovery				65%	225%	97%	44%
B-DC05-Z-1B Pre Spike	-200 TM	2.0058	µg/mL	22.3	104	1.88	2.50
Precent Recovery				48%	30%	71%	70%
B-DC05-Z-1B Pre Spike	-200 TM	2.0058	µg/mL	4.74	22.4	0.400	0.523
Precent Recovery				83%	63%	77%	84%
B-DC05-Z-1B Pre Spike	-200 TM	2.0058	µg/mL	0.424	2.33	0.041	0.043
Precent Recovery				21%	122%	80%	26%
B-DC05-Z-1B Post Spike	-200 TM	2.0150	µg/mL	21.2	111	1.51	2.95
Precent Recovery				76%	66%	105%	100%
Spiking Solution			µg/mL	10.0	50.4	9.89	10.0
Precent Recovery				100%	101%	99%	100%
Check Standard			µg/mL	5.07	25.1	1.99	5.01
Precent Recovery				101%	100%	100%	100%
Blank			µg/mL	0.044	0.000	0.004	0.007

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
nstrument Detection Limit			µg/mL				
Check Standard			µg/mL	5.06	25.2	2.03	5.05
Precent Recovery				101%	101%	101%	101%
Calibration Verification Standard			µg/mL	2.63	12.6	1.03	2.50
Precent Recovery				105%	101%	103%	100%
Quantitation Limit Standard 1			µg/mL	1.01	4.93	0.393	1.00
Precent Recovery				101%	99%	98%	100%
Quantitation Limit Standard 2			µg/mL	0.506	2.47	0.208	0.498
Precent Recovery				101%	99%	104%	100%
Blank			µg/mL	0.026	0.012	0.000	0.001
Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
B-NV27-T-1A	TCLP	100.3	µg/mL	0.4074	3.354	0.1202	0.181
B-NV27-T-1A	TCLP	100.8	µg/mL	0.313	3.09	0.096	0.182
B-NV27-T-1B	TCLP	100.0	µg/mL	0.332	2.91	0.109	0.161
B-NV27-T-1B	TCLP	103.0	µg/mL	0.294	2.90	0.109	0.142
B-NV27-T-1B Pre Spike	TCLP	100.3	µg/mL	1.16	6.30	0.104	0.581
Precent Recovery				101%	97%	99%	102%
B-NV27-T-1B Pre Spike	TCLP	100.3	µg/mL	1.16	6.36	0.107	0.585
Precent Recovery				102%	98%	105%	103%
B-NV27-T-1A Post Spike	TCLP	100.3	µg/mL	1.261	6.38	1.072	1.096
Precent Recovery				112%	100%	103%	101%

Sample ID	Matrix	Weight (g)	Units	Copper	Lead	Antimony	Zinc
			µg/mL				
Check Standard			µg/mL	5.05	25.0	2.02	4.99
Precent Recovery				101%	100%	101%	100%
Calibration Verification Standard			µg/mL	2.65	12.6	1.01	2.50
Precent Recovery				106%	101%	101%	100%
Quantitation Limit Standard 1			µg/mL	1.02	4.99	0.399	1.01
Precent Recovery				102%	100%	100%	101%
Quantitation Limit Standard 2			µg/mL	0.513	2.46	0.213	0.501
Precent Recovery				103%	98%	106%	100%
Blank			µg/mL	0.027	0.000	0.004	0.006
Method Blank (1)	Soil		µg/mL	0.024	0.085	0.086	0.000
Method Blank (2)	Soil		µg/mL	0.001	0.000	0.001	0.000
Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.000
B-NV22-M-1A	-200 TM	8.4331	µg/g	88.9	1661	211	14.5
B-NV22-M-1A	-200 TM	8.0245	µg/g	102	1662	214	15.6
B-NV22-M-1A Post Spike	-200 TM	8.4331	µg/mL	4.76	73.9	9.69	1.60
Precent Recovery				101%	78%	79%	99%
Method Blank (1)	Soil		µg/mL	0.062	0.266	0.012	0.003
B-DC05-K-1A	-200 TM	7.9619	µg/g	54.6	1047	92.3	9.47
B-DC05-K-1A	-200 TM	7.9903	µg/g	44.4	1047	90.2	8.30
B-DC05-K-1A	-200 TM	8.0577	µg/g	65.4	1041	90.6	10.5
B-DC05-K-1A	-200 TM	8.3371	µg/g	40.6	1078	94.4	8.20
B-DC05-K-1A Post Spike	-200 TM	7.9619	µg/mL	3.20	46.5	4.70	1.35
Precent Recovery				102%	96%	103%	98%
Check Standard			µg/mL	5.08	25.4	2.02	5.05
Precent Recovery				102%	102%	101%	101%
Blank			µg/mL	0.038	0.075	0.011	0.014
B-NV22-M-1A	-200 TM	8.4331	µg/g	92.0	1759	220	16.0
B-NV22-M-1A	-200 TM	8.0245	µg/g	106	1753	227	16.2
B-NV22-M-1A Post Spike	-200 TM	8.4331	µg/g	1.87	19.7	2.85	1.17
Precent Recovery				109%	98%	100%	104%
Spiking Solution			µg/mL	10.7	50.9	10.14	10.1
Precent Recovery				107%	102%	101%	101%
Check Standard			µg/mL	5.16	25.3	2.07	5.04
Precent Recovery				103%	101%	103%	101%
Blank			µg/mL	0.059	0.065	0.000	0.026

ample ID	Matrix	Weight g	Units	Copper	Lead	Antimony	Zinc
ıstrument Detection Limit			µg/mL				
:heck Standard			µg/mL	5.02	25.0	1.99	5.02
ercent Recovery				100%	100%	100%	100%
:alibration Verification Standard			µg/mL	2.57	12.9	1.04	2.59
ercent Recovery				103%	103%	104%	104%
:uantitation Limit Standard High				1.01	5.19	0.415	1.05
ercent Recovery				101%	104%	104%	105%
:uantitation Limit Standard Low			µg/mL	0.497	2.67	0.215	0.531
ercent Recovery				99%	107%	107%	106%
lank			µg/mL	0.025	0.011	0.001	0.009
lethod Blank (1) 01-05-97	Soil		µg/mL	0.032	0.005	0.000	0.000
lethod Blank (2) 01-05-97	Soil		µg/mL	0.000	0.000	0.000	0.000
lethod Blank (3) 01-05-97	Soil		µg/mL	0.000	0.000	0.000	0.000
lethod Blank (1) 01-07-97	Soil		µg/mL	0.000	0.000	0.000	0.000
lethod Blank (2) 01-07-97	Soil		µg/mL	0.000	0.000	0.000	0.000
lethod Blank (3) 01-07-97	Soil		µg/mL	0.000	0.000	0.000	0.000
lethod Blank (1) 01-08-97	Soil		µg/mL	0.000	0.000	0.000	0.000
lethod Blank (2) 01-08-97	Soil		µg/mL	0.000	0.000	0.000	0.000
lethod Blank (3) 01-08-97	Soil		µg/mL	0.000	0.000	0.000	0.000
heck Standard			µg/mL	5.10	25.3	2.03	5.07
ercent Recovery				102%	101%	101%	101%
lank			µg/mL	0.066	0.050	0.000	0.015

Fort Polk Demonstration Project
Project# G-337318-26
Analyst: Kevin M. Blann

5/13/97
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Sample ID	Matrix	Weight	Units	Fe	K	Mg	Mn	Na	Ca
Instrument Detection Limit			ug/mL						
Calibration Standard 3			ug/mL	11.0	99.3	10.1	10.1	99.4	100.5
Precent Recovery				112%	99%	101%	101%	99%	101%
Calibration Standard 2			ug/mL	5.12	49.1	5.13	5.12	48.89	50.6
Precent Recovery				106%	98%	103%	102%	98%	101%
Calibration Verification Standard			ug/mL	2.49	25.2	2.61	2.60	24.77	25.51
Precent Recovery				107%	101%	104%	104%	99%	102%
Calibration Standard 1			ug/mL	-0.187	-0.980	-0.005	-0.018	0.535	0.024
Quantitation Limit Standard 1			ug/mL	0.803	9.88	1.04	1.03	10.16	10.94
Precent Recovery				99%	99%	104%	103%	102%	109%
Quantitation Limit Standard 2			ug/mL	0.264	5.38	0.541	0.529	5.382	5.542
Precent Recovery				90%	108%	108%	106%	108%	111%
B-DC06-T-1D-1		8.4658	ug/mL	1024	63.1	48.4	2.99	484	141
			ug/g	12096	746	572	35.3	5719	1660
B-DC04-U-1E-1		7.9537	ug/mL	964	31.5	37.2	4.04	12.2	20.3
			ug/g	12115	397	468	50.7	153	255
B-DC06-P-1A-1		8.0021	ug/mL	3242	66.9	423	161	2146	216
			ug/g	40514	836	5291	2007	26818	2704
B-DC06-L-1A-1		8.0754	ug/mL	1567	110	73.8	4.56	2754	76.4
			ug/g	19400	1358	913	56.5	34104	946
B-DC06-F-1A-2		8.0266	ug/mL	904	50.6	46.6	2.69	426	78
			ug/g	11268	631	581	33.5	5310	977
Calibration Standard 3			ug/mL	11.0	99.3	10.1	10.1	NA	NA
Precent Recovery				110%	99%	101%	101%	NA	NA
Calibration Standard 2			ug/mL	5.12	49.1	5.13	5.12	NA	NA
Precent Recovery				102%	98%	103%	102%	NA	NA
Calibration Standard 1			ug/mL	-0.187	-0.980	-0.005	-0.018	NA	NA
B-DC06-F-1A-2 POST SPIKE			ug/mL	8.19	33.18	3.168	3.177	29.6	44.0
Precent Recovery				103%	104%	107%	98%	104%	87%
Calibration Standard 3			ug/mL	10.6	98.3	10.1	10.1	100.7	101
Precent Recovery				106%	98%	101%	101%	101%	101%
Calibration Standard 2			ug/mL	5.16	49.21	5.07	5.04	49.37	50.4
Precent Recovery				103%	98%	101%	101%	99%	101%
Calibration Standard 1			ug/mL	-0.135	-0.272	0.103	0.088	0.930	0.036

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QA Data Summary

TCLP Matrix Spike Recoveries

	Date	Matrix	Copper	Lead	Antimony	Zinc	Comment
1	19-Nov-96	Treated	93%	110%	157%	90%	
2		Treated	101%	96%	57%	96%	
3	22-Nov-96	Field Blank	102%	100%	90%	99%	
4		Field Blank	99%	100%	93%	108%	
5	25-Nov-96	Treated	105%	105%	103%	110%	
6		Treated	103%	99%	131%	107%	
7	27-Nov-96	Treated	106%	96%	71%	108%	
8		Treated	107%	100%	76%	108%	
9	02-Dec-96	Treated	108%	95%	158%	112%	
10		Treated	109%	107%	145%	116%	
11	04-Dec-96	Treated	102%	98%	99%	106%	
12		Treated	102%	98%	105%	106%	
13		Untreated	102%	94%	101%	110%	
14		Untreated	106%	105%	98%	107%	
15	05-Dec-96	Treated	95%	81%	74%	93%	
16		Treated	93%	92%	136%	105%	
17	06-Dec-96	Treated	104%	97%	10%	107%	
18		Treated	104%	96%	75%	106%	
19	10-Dec-96	Treated	100%	92%	64%	96%	
20		Treated	101%	92%	171%	105%	
21		Treated	110%	92%	122%	108%	
22		Treated	105%	99%	121%	102%	
23	12-Dec-96	Untreated	106%	110%	77%	108%	
24		Untreated	103%	105%	56%	106%	
25	16-Dec-96	Treated	96%	96%	61%	92%	
26		Treated	99%	99%	125%	104%	
	Average		102%	98%	99%	104%	
	Std. Dev.		4.6%	6.3%	38%	6.4%	Antimony levels were low and no HCl was used in the digestion resulting in high standard deviation.

TCLP Analytical Spike

	Date	Matrix	Copper	Lead	Antimony	Zinc	Comment
1	19-Nov-96	Treated	103%	95%	108%	98%	
2	22-Nov-96	Field Blank	94%	87%	94%	94%	
3	25-Nov-96	Treated	100%	94%	102%	102%	
4	27-Nov-96	Treated	101%	92%	99%	99%	
5	02-Dec-96	Treated	91%	83%	98%	90%	

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6	04-Dec-96	Treated	112%	100%	103%	101%	Reanalysis performed March 17, 1997.
7		Untreated	95%	89%	94%	95%	
8	05-Dec-96	Treated	91%	83%	95%	94%	
9	06-Dec-96	Treated	98%	92%	98%	97%	
10	10-Dec-96	Treated	103%	100%	102%	100%	
11		Treated	102%	107%	85%	101%	
12	12-Dec-96	C	99%	99%	102%	97%	
13	13-Dec-96	K	102%	95%	100%	104%	
14	16-Dec-96	Untreated	104%	100%	102%	107%	
15		Treated	92%	87%	96%	92%	
16	18-Dec-96	Untreated	100%	103%	97%	98%	
17	30-Dec-96	C	101%	96%	101%	103%	
18	31-Dec-96	P	107%	120%	101%	109%	
19	03-Jan-97	Wz	101%	97%	104%	102%	
20	06-Jan-97	Untreated L	108%	-33%	109%	102%	Poor Pb recovery is a result of inappropriate spike concentration, sample Pb concentration is very high.
	Average		100%	96%	100%	99%	Jan. 6 Pb data not included in average or standard deviation.
	Std. Dev.		5.6%	8.8%	5.3%	4.8%	

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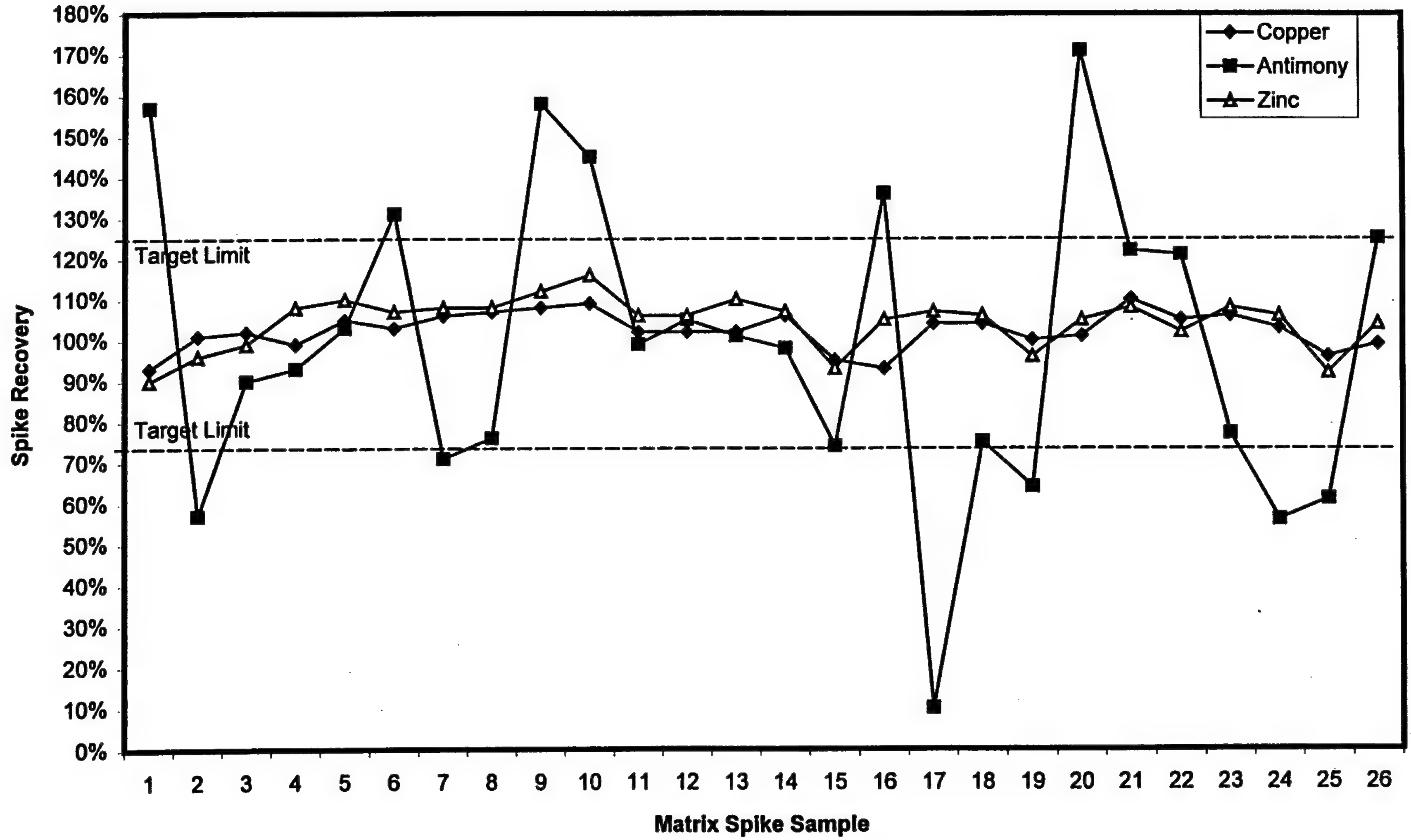
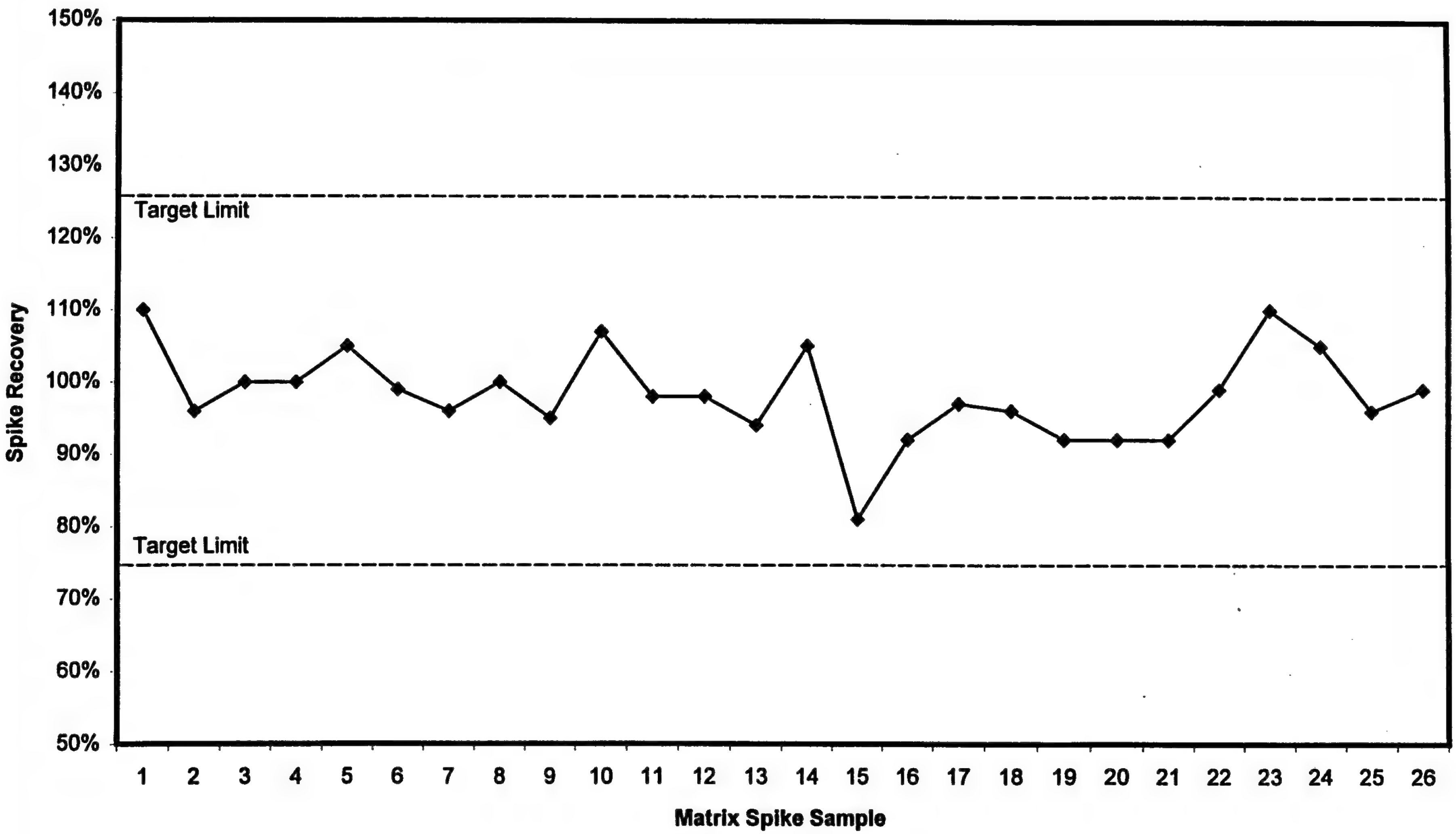
TCLP Matrix Spike Recoveries - Vendor 2 (Hydrochloric Acid)
Copper, Antimony and Zinc

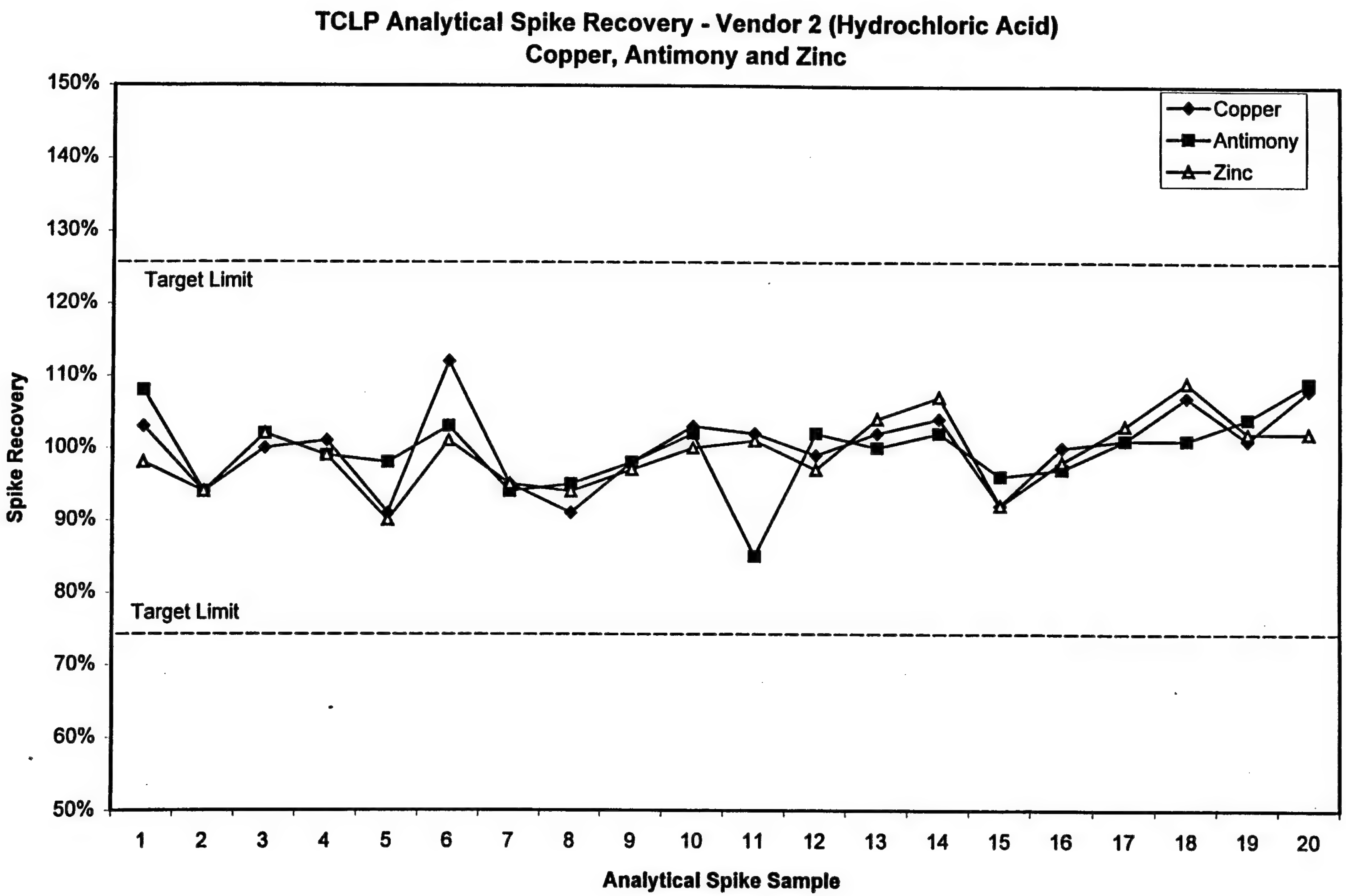


Battelle

TCLP Matrix Spike Recoveries - Vendor 2 (Hydrochloric Acid)
Lead



Battelle



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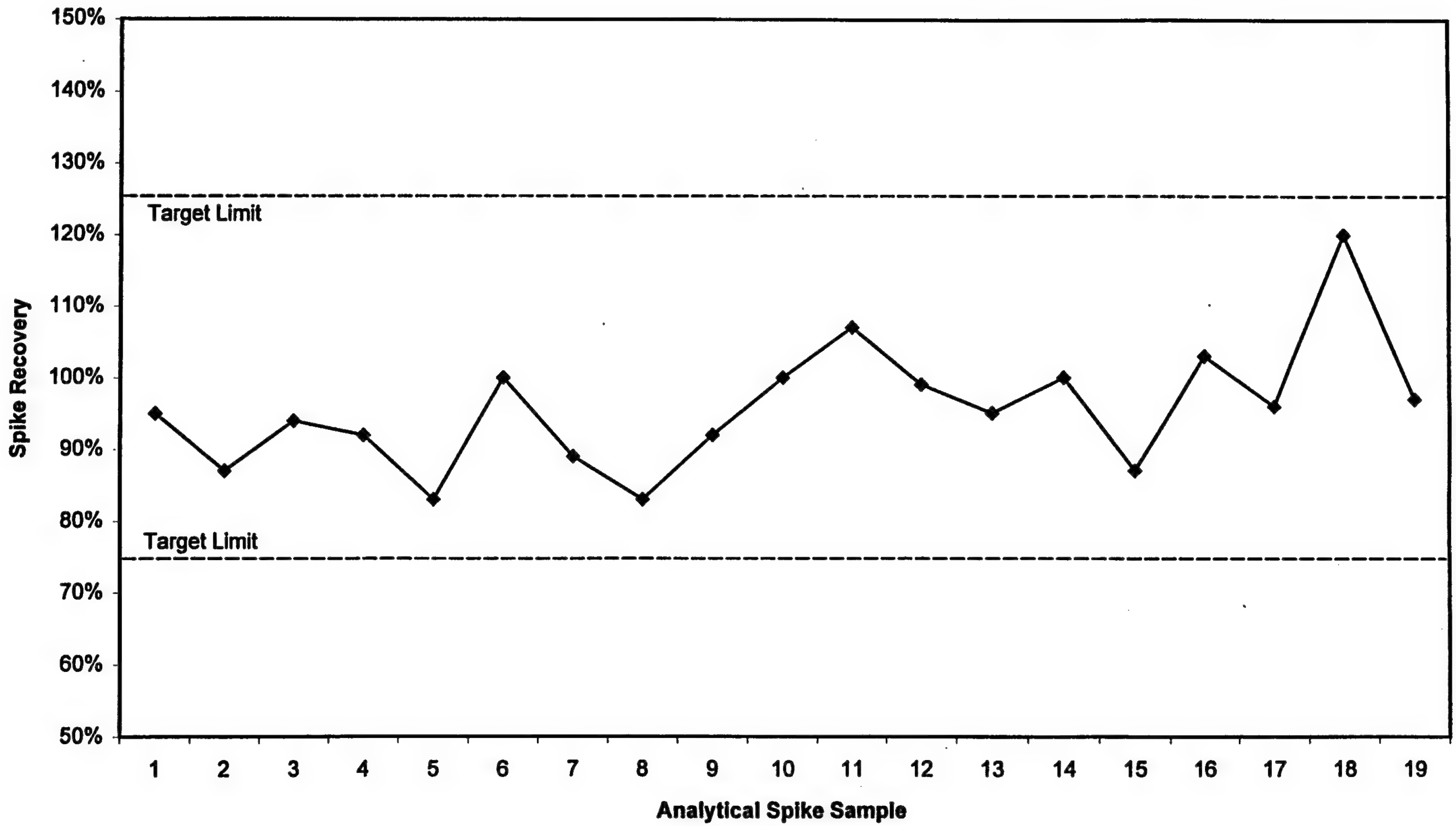
TCLP Analytical Spike Recovery - Vendor 2 (Hydrochloric Acid)
Lead



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Total Metals Matrix Spike Recoveries

	Date	Matrix	Copper	Lead	Antimony	Zinc	Comment
1	22-Nov-96	Treated	97%	94%	83%	99%	
2		Treated	97%	98%	91%	98%	
3		Treated	108%	93%	84%	108%	
4		Treated	101%	102%	93%	105%	
5	27-Nov-96	Treated	103%	98%	79%	103%	
6		Treated	102%	98%	78%	101%	
7	03-Dec-96	Treated	104%	97%	112%	105%	
8		Treated	119%	113%	126%	126%	
9	09-Dec-96	Treated	99%	93%	89%	102%	
10		Treated	102%	94%	100%	105%	
11	10-Dec-96	Treated	103%	93%	67%	99%	
12		Treated	101%	91%	61%	97%	
13	13-Dec-96	Treated	109%	96%	103%	103%	
14		Treated	101%	102%	110%	100%	
15	17-Dec-96	Treated	95%	91%	84%	97%	
16		Treated	97%	94%	74%	99%	
17	18-Dec-96	Treated	98%	95%	97%	97%	
18		Treated	98%	96%	100%	99%	
19	31-Dec-96	Treated	90%	93%	92%	91%	
20		Treated	82%	88%	87%	81%	
21	03-Jan-97	Treated	103%	97%	77%	105%	
22		Treated	98%	101%	84%	100%	
23	09-Jan-97	F	98%	97%	74%	98%	
24		F	98%	98%	73%	101%	
25	10-Jan-97	Untreated	104%	114%	89%	105%	
26		Untreated	103%	110%	82%	104%	
27	15-Jan-97	K	97%	97%	68%	99%	
28		K	98%	100%	64%	103%	
29	16-Jan-97	Untreated	97%	95%	71%	99%	
30		Untreated	104%	101%	82%	105%	
31	23-Jan-97	Untreated	94%	98%	77%	100%	
32		Untreated	99%	97%	76%	101%	
33	24-Jan-97	L	100%	101%	94%	99%	
34		L	97%	96%	87%	96%	
35	30-Jan-97	Organic	77%	54%	81%	88%	Inappropriate spike level, sample concentrations were very high.
36		Organic	48%	-30%	71%	70%	Inappropriate spike level, sample concentrations were very high.

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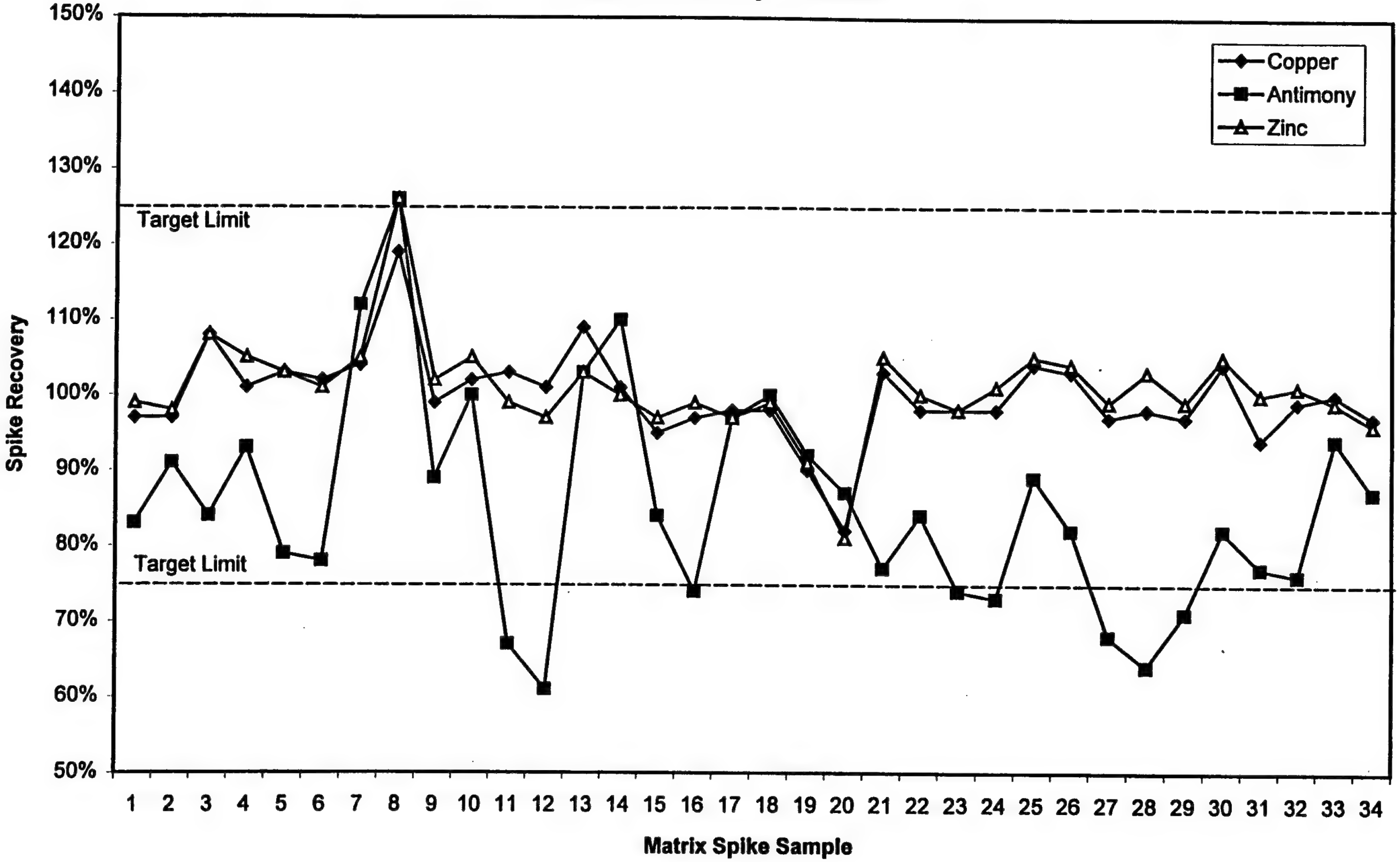
Date	Matrix	Copper	Lead	Antimony	Zinc	Comment
Average		100%	98%	86%	101%	Average Sb recoveries were low.
Std. Dev.		6%	6%	14%	7%	

Total Metals Matrix Spike Recovery - Vendor 2 (Hydrochloric Acid)
Copper, Antimony and Zinc



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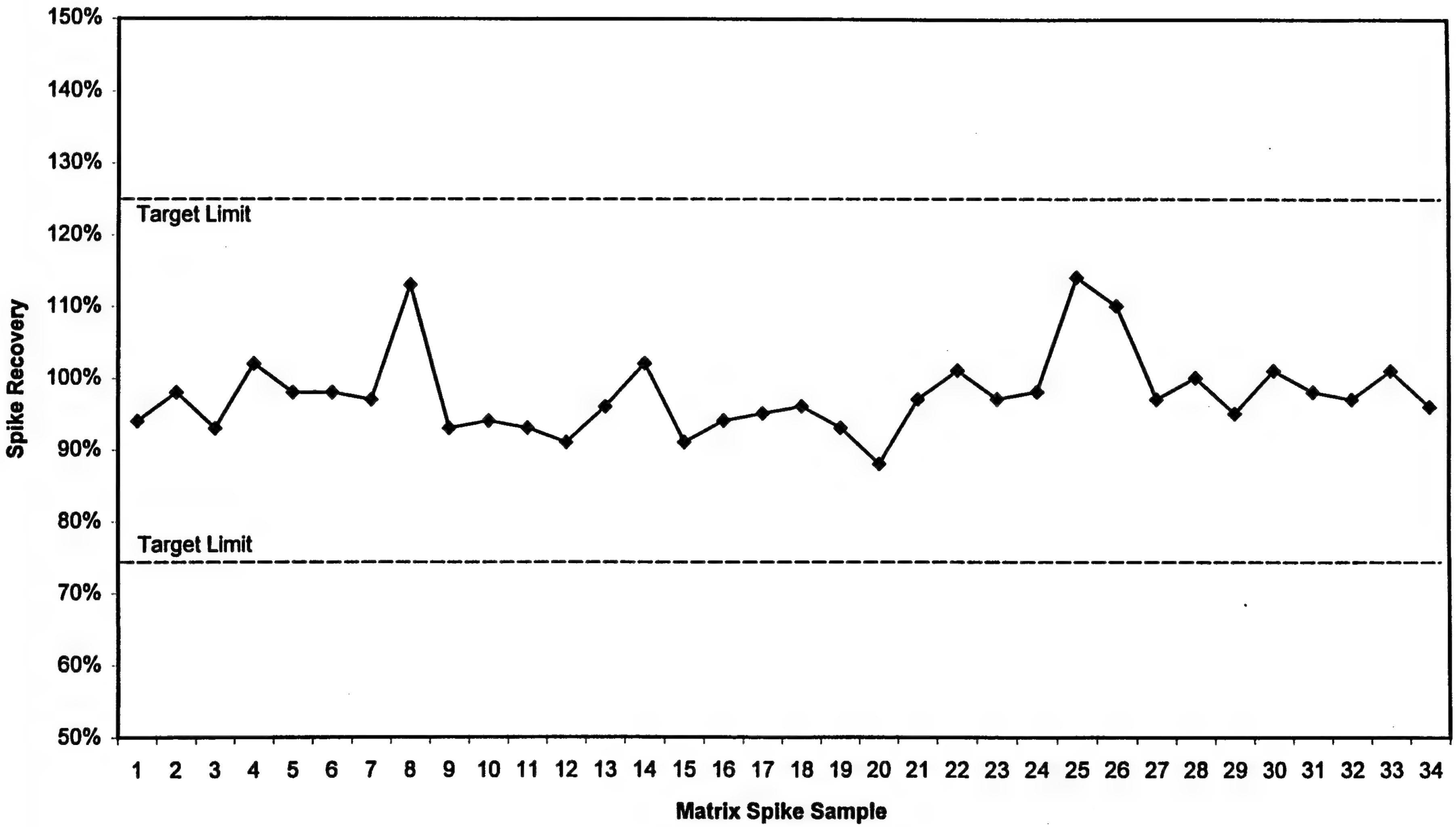
Total Metals Matrix Spike Recovery - Vendor 2 (Hydrochloric Acid)
Lead



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Total Metals Analytical Spike Recoveries

	Date		Copper	Lead	Antimony	Zinc	Comment
1	22-Nov-96	Treated	76%	79%	90%	84%	
2		Treated	80%	83%	94%	80%	
3	25-Nov-96	Field Blank	83%	79%	82%	81%	
4	27-Nov-96	Treated	101%	93%	108%	97%	
5	03-Dec-96	Treated	97%	94%	88%	86%	
6	09-Dec-96	Treated	84%	89%	77%	80%	
7		Treated	73%	74%	68%	77%	
8	10-Dec-96	Treated	78%	80%	71%	76%	
9	11-Dec-96	Treated	78%	74%	71%	74%	
10	12-Dec-96	Treated	83%	79%	80%	78%	
11	13-Dec-96	Treated	77%	73%	66%	80%	
12	16-Dec-96	Treated	84%	79%	108%	82%	
13	17-Dec-96	Treated	83%	76%	85%	82%	
14	18-Dec-96	Treated	73%	70%	73%	73%	
15	31-Dec-96	Treated	85%	101%	104%	98%	
16	03-Jan-97	Treated	98%	99%	107%	97%	
17	06-Jan-97	M	109%	98%	100%	104%	Reanalysis on March 18, 1997.
18		Untreated	193%	83%	97%	117%	
19	08-Jan-97	Untreated	135%	79%	98%	100%	
20	09-Jan-97	F	153%	92%	91%	98%	
21	10-Jan-97	Untreated	190%	122%	110%	109%	
22	13-Jan-97	Untreated	160%	91%	89%	108%	
23	15-Jan-97	K	99%	100%	97%	98%	
24	16-Jan-97	Untreated	130%	86%	106%	98%	
25	21-Jan-97	Untreated	207%	97%	107%	119%	
26	23-Jan-97	Untreated	102%	102%	106%	106%	
27		WZ	65%	80%	88%	21%	
28		K	102%	96%	103%	98%	Reanalysis on March 18, 1997.
29		P	2260%	1000%	263%	393%	Inappropriate spike level, sample concentrations very high. Not included in average or S.D.
30	24-Jan-97	L	161%	89%	96%	100%	
31	27-Jan-97	C	112%	102%	103%	101%	
32	30-Jan-96	Organic	76%	66%	105%	100%	
	Average		107%	87%	93%	90%	
	Std. Dev.		39%	12%	13%	18%	

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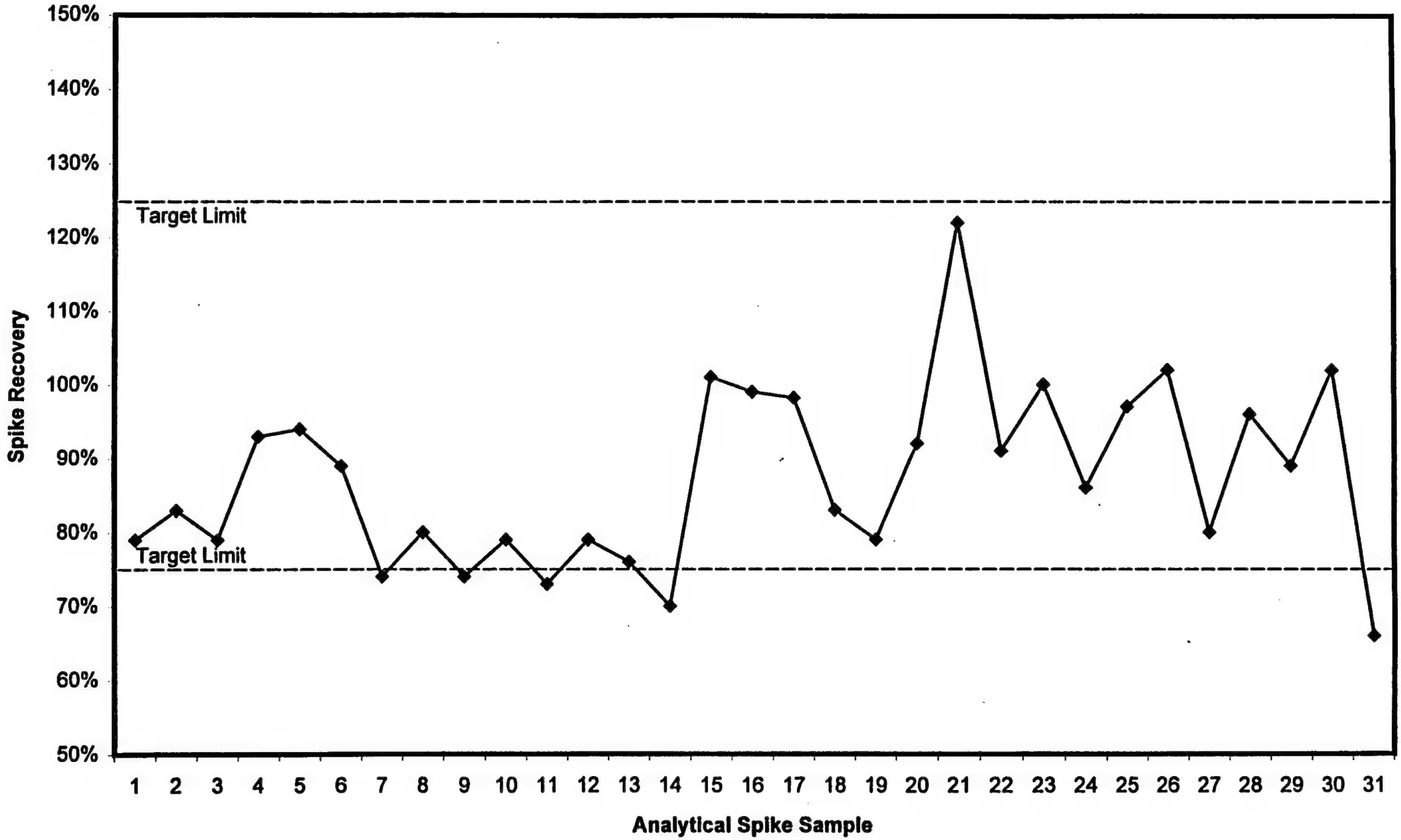
Total Metals Analytical Spike Recovery - Vendor 2 (Hydrochloric Acid)
Lead



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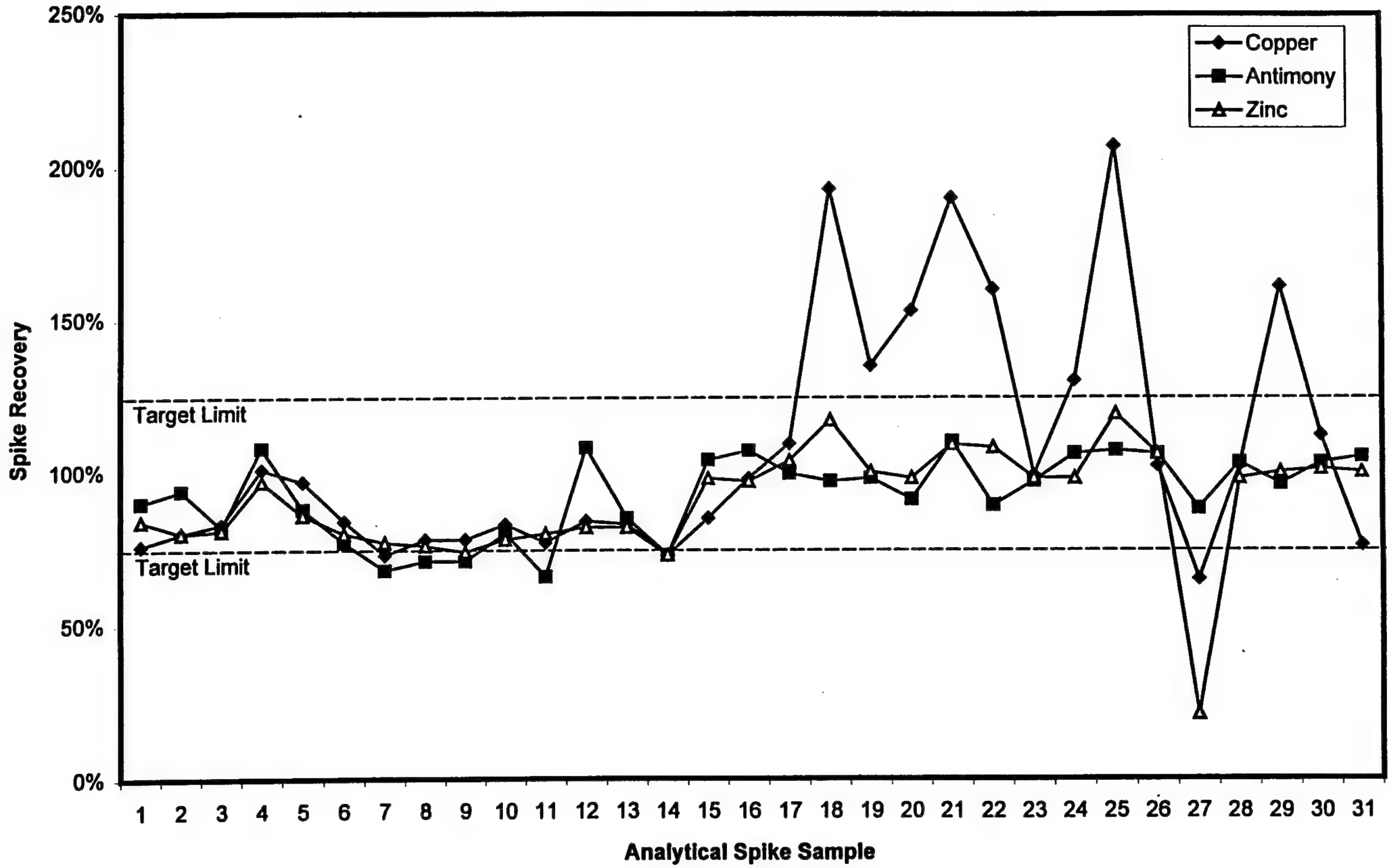
Total Metals Analytical Spike Recovery - Vendor 2 (Hydrochloric Acid)
Copper, Antimony and Zinc



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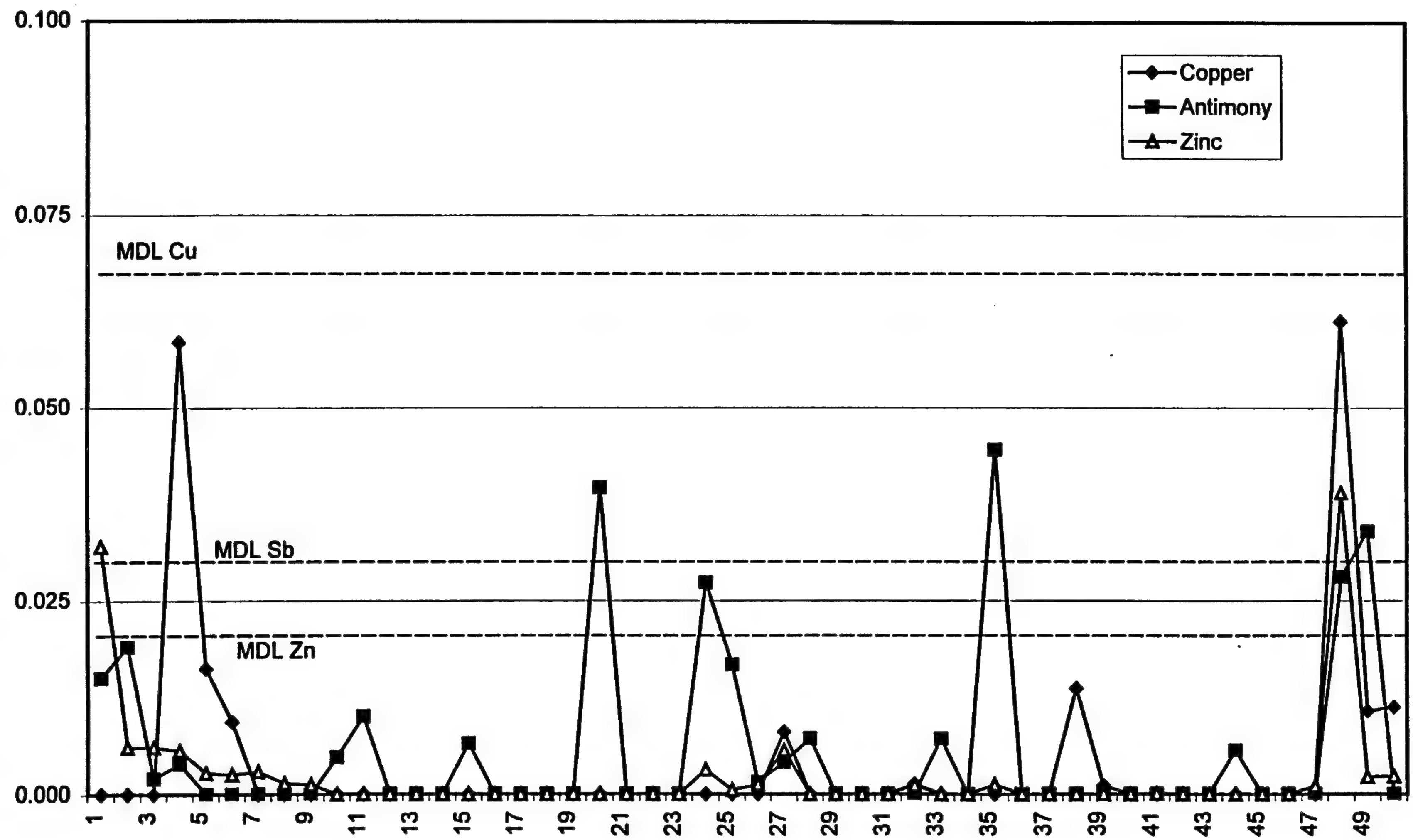
TCLP Method Blank - Vendor 2 (Hydrochloric Acid)
Copper, Antimony and Zinc



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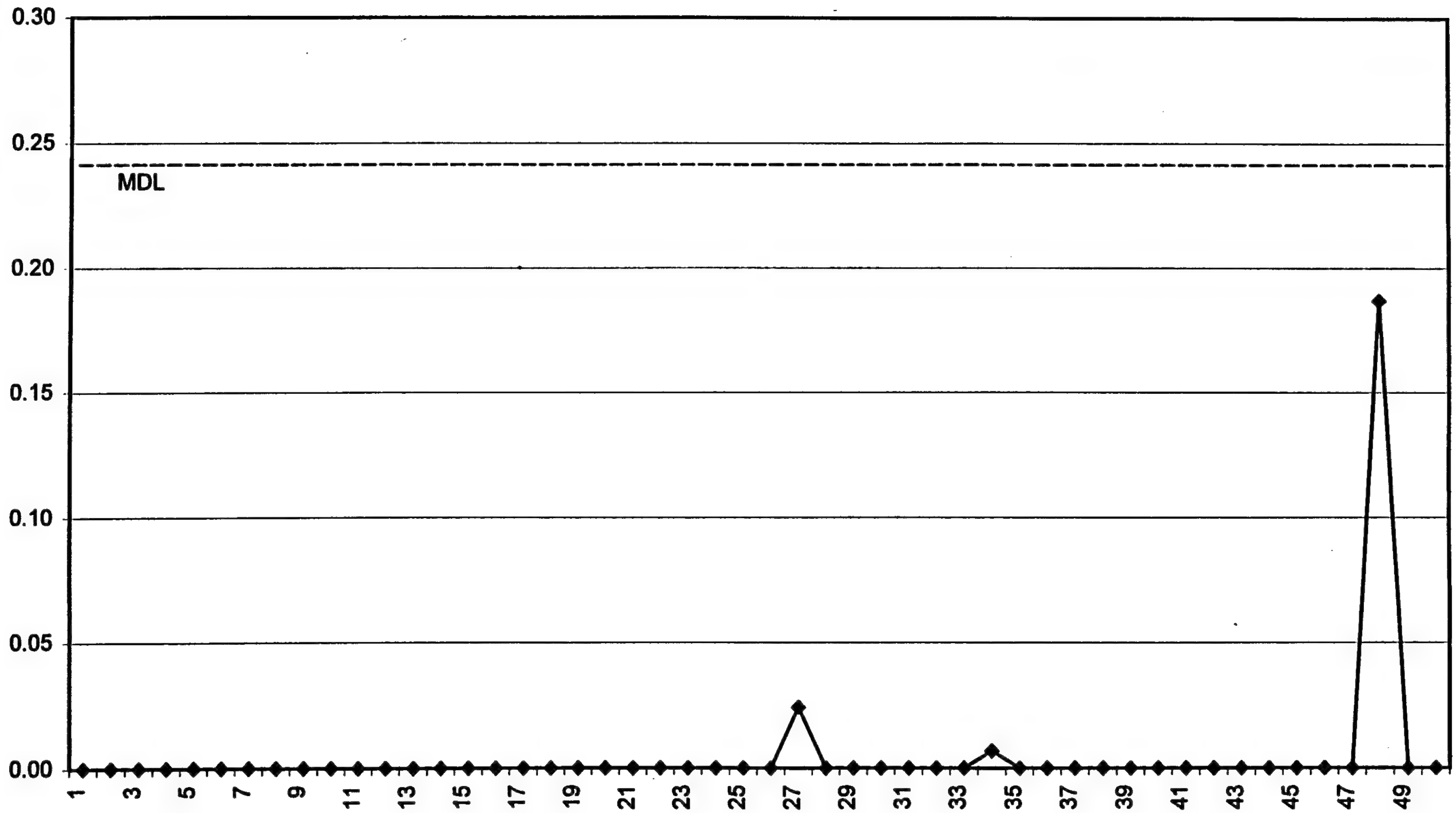
TCLP Method Blank - Vendor 2 (Hydrochloric Acid)
Lead



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	Sample ID	Matrix	Weight	Units	Copper	Lead	Antimony	Zinc
19-Nov-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.015	0.032
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.019	0.006
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.002	0.006
22-Nov-96	Method Blank (1)	TCLP		µg/mL	0.059	0.000	0.004	0.006
	Method Blank (2)	TCLP		µg/mL	0.016	0.000	0.000	0.003
	Method Blank (3)	TCLP		µg/mL	0.009	0.000	0.000	0.003
25-Nov-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.003
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.001
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.001
27-Nov-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.005	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.010	0.000
2-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
4-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.007	0.000
	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
5-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.040	0.000
6-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
10-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.027	0.003
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.017	0.001
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.002	0.001
	Method Blank (1)	TCLP		µg/mL	0.008	0.024	0.004	0.006
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.007	0.000
12-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
13-Dec-96	Method Blank (1)	TCLP		µg/mL	0.001	0.000	0.000	0.001
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.007	0.000
	Method Blank (3)	TCLP		µg/mL	0.000	0.007	0.000	0.000
16-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.045	0.001
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (1)	TCLP		µg/mL	0.014	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.001	0.000	0.000	0.000
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
18-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.000
30-Dec-96	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.006	0.000
	Method Blank (3)	TCLP		µg/mL	0.000	0.000	0.000	0.000
3-Jan-97	Method Blank (1)	TCLP		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	TCLP		µg/mL	0.000	0.000	0.000	0.001

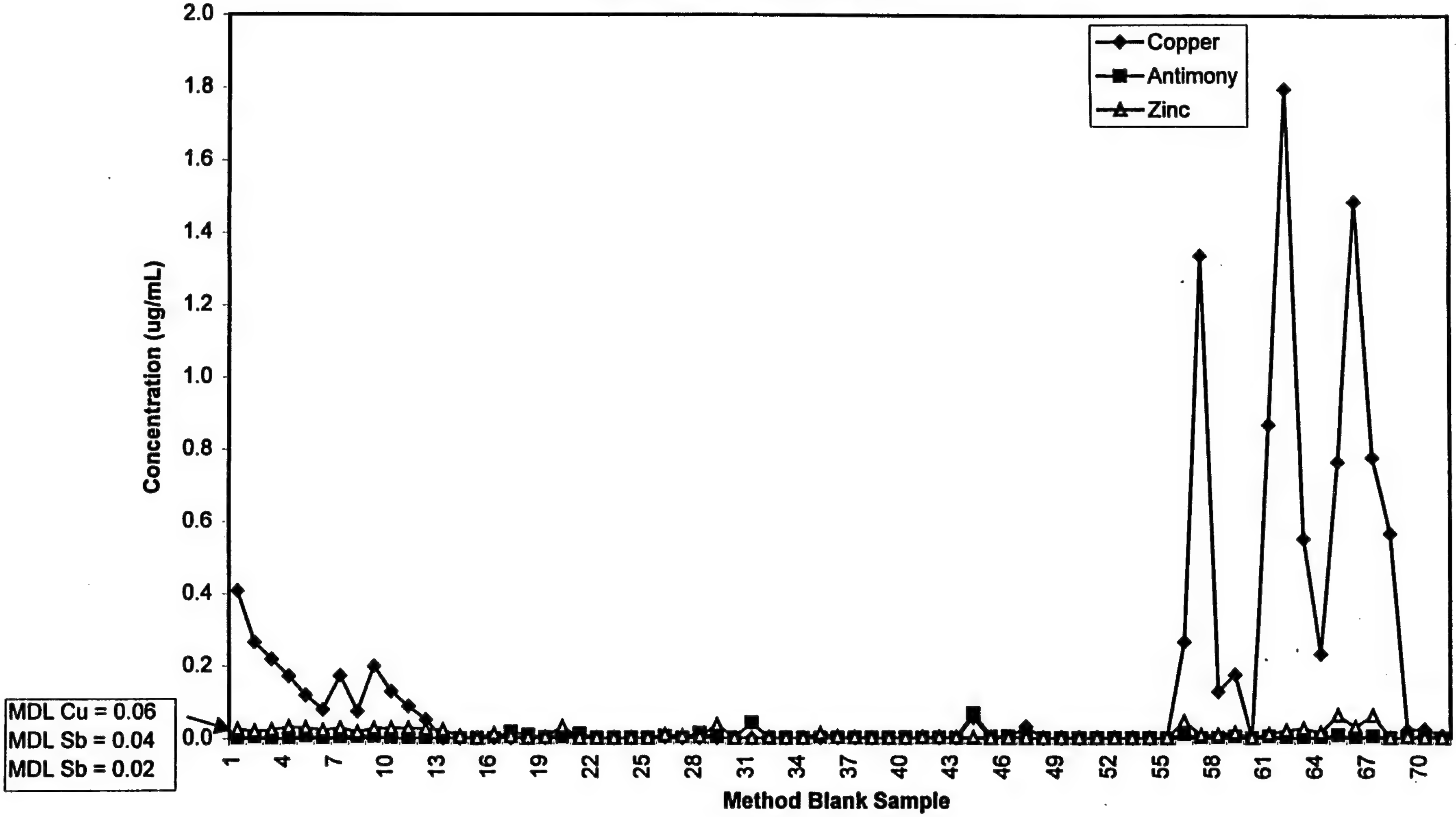
TCLP MBlk

6-Jan-97	Method Blank (1)	TCLP	µg/mL	0.061	0.187	0.028	0.039
	Method Blank (2)	TCLP	µg/mL	0.011	0.000	0.034	0.002
	Method Blank (3)	TCLP	µg/mL	0.011	0.000	0.000	0.002
	Average			0.004	0.004	0.006	0.002
	Standard Deviation			0.012	0.027	0.011	0.007

	Sample ID	Matrix	Weight	Units	Copper	Lead	Antimony	Zinc
22-Nov-96	Method Blank (1)	SOIL		µg/mL	0.408	0.185	0.000	0.026
	Method Blank (2)	SOIL		µg/mL	0.266	0.019	0.005	0.020
	Method Blank (3)	SOIL		µg/mL	0.219	0.000	0.000	0.024
25-Nov-96	Method Blank (1)	SOIL		µg/mL	0.173	0.097	0.000	0.032
	Method Blank (2)	SOIL		µg/mL	0.120	0.014	0.008	0.030
	Method Blank (3)	SOIL		µg/mL	0.080	0.000	0.000	0.023
27-Nov-96	Method Blank (1)	Soil		µg/mL	0.173	0.031	0.004	0.029
	Method Blank (2)	Soil		µg/mL	0.075	0.000	0.006	0.017
	Method Blank (3)	Soil		µg/mL	0.199	0.000	0.006	0.028
3-Dec-96	Method Blank (1)	Soil		µg/mL	0.129	0.085	0.000	0.028
	Method Blank (2)	Soil		µg/mL	0.088	0.006	0.000	0.0281
	Method Blank (3)	Soil		µg/mL	0.052	0.000	0.000	0.026
9-Dec-96	Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.022
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.005
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (1)	Soil		µg/mL	0.000	0.024	0.000	0.012
10-Dec-96	Method Blank (1)	Soil		µg/mL	0.000	0.000	0.017	0.004
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.009	0.001
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.002	0.002
11-Dec-96	Method Blank (1)	Soil		µg/mL	0.009	0.018	0.000	0.031
	Method Blank (2)	Soil		µg/mL	0.005	0.013	0.011	0.000
	Method Blank (3)	Soil		µg/mL	0.001	0.000	0.000	0.000
12-Dec-96	Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.000
13-Dec-96	Method Blank (1)	Soil		µg/mL	0.003	0.059	0.005	0.008
	Method Blank (2)	Soil		µg/mL	0.000	0.045	0.000	0.005
	Method Blank (3)	Soil		µg/mL	0.000	0.026	0.014	0.004
16-Dec-96	Method Blank (1)	Soil		µg/mL	0.000	0.065	0.000	0.036
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.042	0.000
17-Dec-96	Method Blank (1)	Soil		µg/mL	0.000	0.014	0.000	0.001
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.000
18-Dec-96	Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.012
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.003
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.002
31-Dec-96	Method Blank (1)	Soil		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.001	0.000
3-Jan-97	Method Blank (1)	Soil		µg/mL	0.002	0.000	0.000	0.002
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.000	0.002
	Metgod Blank (3)	Soil		µg/mL	0.000	0.000	0.000	0.002
6-Jan-97	Method Blank (1)	Soil		µg/mL	0.055	0.111	0.068	0.001
	Method Blank (2)	Soil		µg/mL	0.000	0.000	0.004	0.000
	Method Blank (3)	Soil		µg/mL	0.000	0.000	0.005	0.000
	Method Blank (1)	Soil		µg/mL	0.03	0.005	0.000	0.000

	Method Blank (2)	Soil	µg/mL	0.00	0.000	0.000	0.000
	Method Blank (3)	Soil	µg/mL	0.00	0.000	0.000	0.000
8-Jan-97	Method Blank (1)	Soil	µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	Soil	µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	Soil	µg/mL	0.000	0.000	0.000	0.000
9-Jan-97	Method Blank (1)	Soil	µg/mL	0.000	0.000	0.000	0.000
	Method Blank (2)	Soil	µg/mL	0.000	0.000	0.000	0.000
	Method Blank (3)	Soil	µg/mL	0.000	0.000	0.000	0.000
10-Jan-97	Method Blank	Soil	µg/mL	0.266	0.027	0.010	0.046
13-Jan-97	Method Blank	Soil	µg/mL	1.34	0.042	0.000	0.008
15-Jan-97	Method Blank	Soil	µg/mL	0.129	0.015	0.001	0.009
16-Jan-97	Method Blank	Soil	µg/mL	0.174	0.096	0.005	0.014
21-Jan-97	Method Blank	Soil	µg/mL	0.000	0.000	0.000	0.000
	Method Blank	Soil	µg/mL	0.865	0.0281	0.0045	0.0105
23-Jan-97	Method Blank	Soil	µg/mL	1.80	0.143	0.001	0.020
	Method Blank	Soil	µg/mL	0.550	0.065	0.000	0.026
	Method Blank	Soil	µg/mL	0.232	0.000	0.001	0.015
	Method Blank	Soil	µg/mL	0.763	0.033	0.008	0.062
24-Jan-97	Method Blank	Soil	µg/mL	1.49	0.171	0.000	0.030
27-Jan-97	Method Blank (1)	Soil	µg/mL	0.775	0.091	0.005	0.061
	Method Blank (2)	Soil	µg/mL	0.564	0.046	0.000	0.000
30-Jan-97	Method Blank	Organic	µg/mL	0.021	0.000	0.000	0.003
	Method Blank	Organic	µg/mL	0.024	0.000	0.008	0.000
	Method Blank	Organic	µg/mL	0.006	0.000	0.000	0.000
	Average			0.156	0.022	0.004	0.011
	Standard Deviation			0.352	0.041	0.010	0.015
	Average Before Jan. 6			0.045	0.018	0.004	0.010
				0.088	0.037	0.012	0.012
	Average Jan. 6 and After			0.361	0.030	0.002	0.012
				0.53	0.048	0.003	0.019
	t-test			0.171273	0.020132	0.004761	0.007213
	Δ			0.316002	0.012822	0.002787	0.002037

Total Metals Method Blank - Vendor 2 (Hydrochloric Acid)
Copper, Antimony and Zinc



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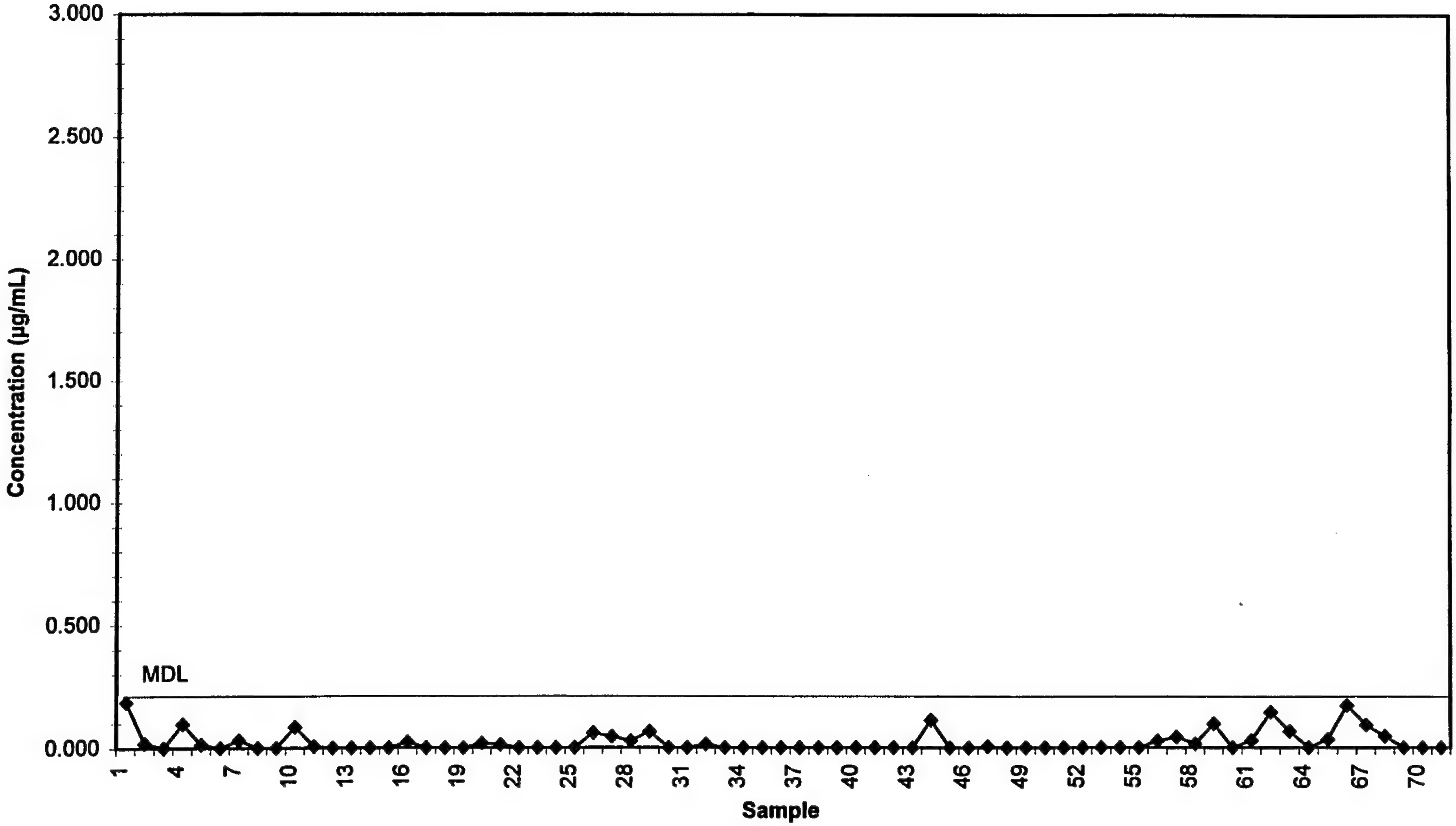
Total Metals Method Blank - Vendor 2 (Hydrochloric Acid)
Lead



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APPENDIX H
XRF Data

Table H-1. XRF Data for Vendor 1

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
9/15/96	T	C-SP15-T-W1	W	263.686	56.236	38.242	67.370	425.534
9/15/96	T	C-SP15-T-W2	W	57.725	0.000	17.443	43.837	119.005
9/15/96	T	C-SP15-T-W3	W	62.844	67.989	0.000	13.674	144.507
9/15/96	T	C-SP15-T-W4	W	82.596	0.000	0.000	22.756	105.352
9/16/96	U	C-SP15-U-W1	W	207.792	39.552	0.000	23.948	271.292
9/17/96	T	C-SP15-T-D1	D	268.097	35.099	0.000	93.609	396.805
9/17/96	T	C-SP15-T-D2	D	66.157	0.000	0.000	49.741	115.898
9/17/96	T	C-SP15-T-D3	D	124.081	0.000	0.000	37.213	161.294
9/17/96	T	C-SP15-T-D4	D	67.916	0.000	0.000	10.702	78.618
9/21/96	U	C-SP21-U-D1	D	377.586	44.057	0.000	44.642	466.284
9/21/96	T	C-SP21-T-D1	D	76.065	21.339	0.000	15.386	112.789
9/21/96	T	C-SP21-T-D2	D	344.134	111.636	29.621	118.684	604.075
9/21/96	T	C-SP21-T-D3	D	70.765	71.830	0.000	38.604	181.199
9/21/96	T	C-SP21-T-D4	D	96.071	66.969	0.000	37.624	200.664
9/21/96	T	C-SP21-T-D5	D	61.876	0.000	0.000	24.512	86.388
9/21/96	T	C-SP21-T-D6	D	365.794	128.170	0.000	113.632	607.596
9/21/96	T	C-SP21-T-W1	W	64.475	20.556	0.000	32.603	117.633
9/21/96	T	C-SP21-T-W2	W	279.562	119.432	24.767	81.398	505.160
9/21/96	T	C-SP21-T-W3	W	74.045	22.248	0.000	22.182	118.476
9/21/96	T	C-SP21-T-W4	W	83.973	19.508	0.000	29.977	133.458
9/21/96	T	C-SP21-T-DW	D	186.463	91.771	0.000	85.462	363.696
9/21/96	T	C-SP21-T-P1	D	263.113	118.149	0.000	69.945	451.207
9/23/96	M	C-SP23-M-W1	W	174.702	51.919	0.000	39.739	266.360
9/23/96	M	C-SP23-M-W2	W	248.778	79.112	0.000	33.132	361.022
9/23/96	T	C-SP23-T-W1	W	143.302	74.855	0.000	16.548	234.705
9/23/96	T	C-SP23-T-W2	W	328.340	235.611	21.597	47.285	632.834
9/23/96	T	C-SP23-T-D2	D	114.011	101.431	0.000	45.763	261.205
9/23/96	T	C-SP23-T-D5	D	172.104	65.393	18.563	46.780	302.839

Table H-1. XRF Data for Vendor 1

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
9/23/96	T	C-SP23-T-D5	D	150.431	46.339	16.843	45.656	259.269
9/23/96	T	C-SP23-T-D9	D	155.024	67.343	0.000	50.947	273.314
9/25/96	T	C-SP25-T-W3	W	163.378	205.363	29.233	44.696	442.670
9/25/96	T	C-SP25-T-W4	W	203.212	101.357	0.000	37.431	342.000
9/25/96	U	C-SP25-U-D2	D	386.840	30.881	0.000	54.794	472.515
9/25/96	T	C-SP25-T-D3	D	145.959	136.578	0.000	80.557	363.094
9/25/96	T	C-SP25-T-D4	D	104.567	98.984	0.000	60.747	264.298
9/26/96	T	C-SP26-T-W1	W	213.851	208.719	17.646	21.718	461.933
9/26/96	T	C-SP26-T-D1	D	298.816	186.030	0.000	55.322	540.168
9/26/96	T	C-SP26-T-D2	D	359.606	129.118	47.036	94.202	629.962
9/26/96	T	C-SP26-T-D3	D	313.178	182.559	77.594	90.891	664.223
9/26/96	T	C-SP26-T-D4	D	367.030	173.244	42.548	58.409	641.230
10/1/96	T	C-OC01-T-V1	W	175.347	44.983	0.000	42.153	262.484
10/1/96	T	C-OC01-T-V1	D	172.652	110.217	0.000	68.802	351.671
10/1/96	T	C-OC01-T-V2	W	137.489	57.588	24.107	29.701	248.885
10/1/96	T	C-OC01-T-V2	D	169.466	105.103	0.000	82.755	357.324
10/1/96	T	C-OC01-T-F1	W	801.604	484.876	68.677	272.790	1627.947
10/1/96	T	C-OC01-T-F1	D	814.750	587.033	76.498	296.187	1774.468
10/1/96	T	C-OC01-T-F2	W	659.771	436.749	34.082	261.833	1392.435
10/1/96	T	C-OC01-T-F2	D	817.279	548.036	0.000	322.127	1687.442
10/1/96	T	C-OC01-T-F3	D	686.197	482.155	63.303	255.470	1487.125
10/1/96	T	C-OC01-T-F4	D	706.452	447.661	56.147	231.902	1442.162
10/1/96	T	C-OC01-T-C1	D	225.822	10.961	0.000	59.464	296.247
10/1/96	T	C-OC01-T-C2	D	235.016	157.436	0.000	50.758	443.210
10/1/96	T	C-OC01-T-C3	D	195.559	116.809	0.000	44.356	356.724
10/1/96	T	C-OC01-T-C4	D	226.401	55.986	0.000	63.135	345.522
10/1/96	T	C-OC01-T-S1	W	284.537	388.636	43.732	61.890	778.794
10/1/96	T	C-OC01-T-S2	W	269.724	427.741	0.000	72.171	769.636

Table H-1. XRF Data for Vendor 1

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
10/1/96	T	C-OC01-T-S2	D	275.018	88.096	0.000	72.620	435.733
10/1/96	T	C-OC01-T-P1	W	524.980	393.583	32.630	264.430	1215.623
10/1/96	T	C-OC01-T-P2	W	562.890	366.321	37.357	290.650	1257.218
10/1/96	T	C-OC01-T-W1	W	204.081	108.257	20.802	48.717	381.856
10/1/96	U	C-OC01-U-D1	D	291.726	54.037	0.000	28.117	373.880
10/1/96	U	C-OC01-U-D2	D	294.135	0.000	18.604	45.390	358.129
10/2/96	T	C-OC02-T-C1	D	202.701	72.870	43.527	49.879	368.977
10/2/96	T	C-OC02-T-C2	D	143.418	139.631	0.000	49.075	332.124
10/2/96	T	C-OC02-T-C3	D	204.980	120.615	17.831	24.284	367.710
10/2/96	T	C-OC02-T-C4	D	211.682	157.812	0.000	37.813	407.307
10/2/96	T	C-OC02-T-C5	D	512.311	476.515	31.126	66.575	1086.527
10/2/96	T	C-OC02-T-F1	D	802.410	512.946	40.174	283.670	1639.200
10/2/96	T	C-OC02-T-F2	D	1179.180	975.889	90.245	397.087	2642.401
10/3/96	T	C-OC03-T-C1	D	203.474	241.459	39.232	42.179	526.343
10/3/96	T	C-OC03-T-C2	D	135.100	54.277	38.980	46.096	274.452
10/3/96	T	C-OC03-T-C3	D	146.696	103.680	0.000	45.389	295.765
10/4/96	T	C-OC04-T-C1	D	141.874	74.261	24.059	16.565	256.759
10/4/96	T	C-OC04-T-C2	D	89.985	0.000	40.915	24.754	155.654
10/4/96	M	C-OC04-M-W1	W	198.900	201.295	52.665	62.798	515.658
10/4/96	M	C-OC04-M-W2	W	341.662	170.597	0.000	29.975	542.234
10/4/96	M	C-OC04-M-W3	W	337.848	266.377	0.000	51.863	656.088
10/4/96	M	C-OC04-M-W4	W	192.567	36.019	20.619	19.045	268.249
10/5/96	T	C-OC05-T-C1	W	217.147	203.495	0.000	45.672	466.314
10/5/96	T	C-OC05-T-C2	W	179.308	134.837	20.691	47.679	382.515
10/5/96	T	C-OC05-T-C3	W	220.403	280.187	25.154	62.819	588.562
10/5/96	T	C-OC05-T-C4	D	116.571	165.505	0.000	51.432	333.508
10/5/96	T	C-OC05-T-C5	D	488.293	415.361	46.233	79.038	1028.925
10/5/96	T	C-OC05-T-F1	D	797.470	875.914	81.663	343.999	2099.046

Table H-1. XRF Data for Vendor 1

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
10/5/96	Q	C-OC05-Q-PA	W	0.000	0.000	120.128	0.000	120.128
10/5/96	Q	C-OC05-Q-PB	W	0.000	0.000	113.462	0.000	113.462
10/5/96	Q	C-OC05-Q-B1	W	1537.680	0.000	264.511	0.000	1802.191
10/5/96	Q	C-OC05-Q-T3	W	1752.890	50.780	272.447	0.000	2076.117
10/5/96	Q	C-OC05-Q-T4	W	1424.890	0.000	219.114	0.000	1644.004
10/5/96	RC	C-OC05-RC	W	5604.240	1081.650	636.681	59.809	7382.380
10/5/96	U	C-OC05-U-D1	D	480.179	0.000	0.000	42.273	522.452
10/7/96	P	C-OC07-P-W1	W	7824.130	1384.270	268.279	296.788	9773.467
10/7/96	P	C-OC07-P-W2	W	8279.520	1335.290	358.616	264.058	10237.484
10/7/96	P	C-OC07-P-W3	W	3100.290	2569.940	179.625	346.493	6196.348
10/7/96	T	C-OC07-T-C1	W	385.385	317.562	44.176	93.087	840.210
10/7/96	T	C-OC07-T-C2	W	361.295	253.090	20.694	110.549	745.628
10/7/96	T	C-OC07-T-C3	W	305.491	240.741	0.000	83.373	629.605
10/7/96	T	C-OC07-T-C4	W	274.333	313.703	28.511	77.160	693.707
10/7/96	RC	C-OC07-RC	W	5754.940	2901.550	685.968	58.120	9400.578
10/7/96	U	C-OC07-U-D1	D	695.142	88.769	36.617	76.289	896.817
10/8/96	T	C-OC08-T-C1	W	765.697	975.764	113.997	155.174	2010.632
10/8/96	T	C-OC08-T-C6	D	865.663	1041.940	90.309	168.641	2166.553
10/8/96	T	C-OC08-T-F1	W	743.801	959.608	59.918	302.629	2065.956
10/8/96	T	C-OC08-T-F2	W	983.934	2002.010	97.568	343.455	3426.967
10/8/96	T	C-OC08-T-F3	W	785.315	934.872	40.072	310.856	2071.115
10/9/96	T	C-OC09-T-F1	W	867.479	1530.600	127.553	395.536	2921.168
10/9/96	T	C-OC09-T-F2	W	932.756	1856.160	67.788	472.796	3329.500
10/9/96	T	C-OC09-T-C1	W	371.028	391.438	47.480	78.383	888.329
10/9/96	T	C-OC09-T-C2	W	330.751	587.339	55.498	62.739	1036.326
10/9/96	T	C-OC09-T-C3	W	475.578	393.031	45.500	107.155	1021.264
10/9/96	T	C-OC09-T-C4	W	600.764	703.008	50.291	137.631	1491.694
10/9/96	T	C-OC09-U-D3	D	735.683	93.951	17.582	86.858	934.074
10/10/96	T	C-OC10-T-F1	T	555.613	299.977	35.047	238.392	1129.029

Table H-2. Comparison of XRF and ICP Data for Lead : Vendor 1

Stream	Stream ID	Date	Average Lead Result by XRF (mg/kg)	Average Lead Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	C-SP15-T	9/15/96	116.71	122.00	-4.34	98.57	2.12
processed soil	C-SP25-T	9/25/96	209.60	330.00	-36.48	83.01	6.28
processed soil	C-OC02-T	10/2/96	471.03	404.00	16.59	150.37	4.52
processed soil	C-OC04-T	10/4/96	367.8	269.0	36.74	36.40	6.36
processed soil	C-OC10-T	10/10/96	544.5	839.0	-35.10	159.57	9.19
Average Result			**341.9**	**392.8**	**-12.95**	**105.6**	**5.69**
raw soil	C-SP15-U	9/15/96	207.8	1,854	-88.79	-	8.8
raw soil	C-SP21-U	9/21/96	377.6	1,407	-73.16	-	97.0
raw soil	C-SP25-U	9/25/96	386.8	3,347	-88.44	-	4.6
raw soil	C-CO11-U	10/11/96	715.4	4,789	-85.06	28.67	80.79
Average Result			**421.9**	**2,849**	**-85.19**	**28.67**	**47.80**
coarse processed fraction	C-OC02-C	10/2/96	255.02	252.0	1.20	146.44	-
Average Result			**255.02**	**252.0**	**1.20**	**146.44**	**0.00**
fine processed fraction	C-OC02-F	10/2/96	990.8	947.0	4.62	266.42	-
Average Result			**990.8**	**947.0**	**4.62**	**266.42**	**0.00**
jig concentrate	C-OC03-M	10/3/96	267.7	484	-44.68	83.2	-
Average Result			**267.7**	**484**	**-44.68**	**83.2**	**0.00**
precipitate sludge	C-OC07-P	10/7/96	6,401	11,990	-46.61	2,868	-
Average Result			**6,401**	**11,990**	**-46.61**	**2,868**	**0.00**

Table H-3. Comparison of XRF and ICP Data for Copper : Vendor 1

Stream	Stream ID	Date	Average Copper Result by XRF (mg/kg)	Average Copper Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	C-SP15-T	9/15/96	31.06	59.8	-48.07	36.18	3.62
processed soil	C-SP25-T	9/25/96	154.30	215.0	-28.23	78.17	2.12
processed soil	C-OC02-T	10/2/96	348.78	359.0	-2.85	178.26	1.11
processed soil	C-OC04-T	10/4/96	381.5	165.0	131.23	86.48	4.95
processed soil	C-OC10-T	10/10/96	703.9	797.0	-11.68	245.69	15.56
Average Result			**323.9**	**319.2**	**1.49**	**125.0**	**5.47**
raw soil	C-SP15-U	9/15/96	39.6	812	-95.13	-	8.2
raw soil	C-SP21-U	9/21/96	44.1	1,516	-97.09	-	956.4
raw soil	C-SP25-U	9/25/96	30.9	1,525	-97.98	-	3.0
raw soil	C-CO11-U	10/11/96	91.4	1,943	-95.30	3.66	75.17
Average Result			**51.5**	**1,449**	**-96.45**	**3.66**	**260.69**
coarse processed fraction	C-OC02-C	10/2/96	193.49	415.0	-53.38	161.35	-
Average Result			**193.49**	**415.0**	**-53.38**	**161.35**	**0.00**
fine processed fraction	C-OC02-F	10/2/96	744.4	1,001.0	-25.63	327.35	-
Average Result			**744.4**	**1,001.0**	**-25.63**	**327.35**	**0.00**
jig concentrate	C-OC03-M	10/3/96	168.6	228	-26.06	97.0	-
Average Result			**168.6**	**228**	**-26.06**	**97.0**	**0.00**
precipitate sludge	C-OC07-P	10/7/96	1,763	2,438	-27.68	699	-
Average Result			**1,763**	**2,438**	**-27.68**	**699**	**0.00**

Table H-4. Comparison of XRF and ICP Data for Zinc : Vendor 1

Stream	Stream ID	Date	Average Zinc Result by XRF (mg/kg)	Average Zinc Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	C-SP15-T	9/15/96	13.92	16.9	-17.63	18.18	0.81
processed soil	C-SP25-T	9/25/96	12.70	32.2	-60.56	15.00	0.92
processed soil	C-OC02-T	10/2/96	32.67	45.4	-28.04	11.61	2.31
processed soil	C-OC04-T	10/4/96	39.0	22.7	71.67	17.63	0.78
processed soil	C-OC10-T	10/10/96	337.3	65.0	418.93	31.21	0.64
Average Result			**87.1**	**36.4**	**139.06**	**18.7**	**1.09**
raw soil	C-SP15-U	9/15/96	0.0	72	-100.00	-	0.0
raw soil	C-SP21-U	9/21/96	0.0	168	-100.00	-	109.5
raw soil	C-SP25-U	9/25/96	0.0	127	-100.00	-	1.7
raw soil	C-CO11-U	10/11/96	27.1	159	-82.96	13.46	8.22
Average Result			**6.8**	**132**	**-94.85**	**13.46**	**29.84**
coarse processed fraction	C-OC02-C	10/2/96	512.53	50.8	908.92	321.97	-
Average Result			**512.53**	**50.8**	**908.92**	**321.97**	**0.00**
fine processed fraction	C-OC02-F	10/2/96	65.2	71.4	-8.67	35.41	-
Average Result			**65.2**	**71.4**	**-8.67**	**35.41**	**0.00**
jig concentrate	C-OC03-M	10/3/96	18.3	32	-42.75	24.9	-
Average Result			**18.3**	**32**	**-42.75**	**24.9**	**0.00**
precipitate sludge	C-OC07-P	10/7/96	269	348	-22.75	89	-
Average Result			**269**	**348**	**-22.75**	**89**	**0.00**

Table H-5. Comparison of XRF and ICP Data for Antimony : Vendor 1

Stream	Stream ID	Date	Average Antimony Result by XRF (mg/kg)	Average Antimony Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	C-SP15-T	9/15/96	36.9	31.7	16.43	23.92	1.78
processed soil	C-SP25-T	9/25/96	38.5	54.5	-29.38	13.93	0.21
processed soil	C-OC02-T	10/2/96	131.4	91.8	43.08	17.51	0.92
processed soil	C-OC04-T	10/4/96	137.0	64.2	113.41	7.33	0.99
processed soil	C-OC10-T	10/10/96	173.6	171.0	1.52	30.25	4.24
Average Result			**103.5**	**82.6**	**25.21**	**18.59**	**1.63**
raw soil	C-SP15-U	9/15/96	23.9	104.6	-77.11	-	1.03
raw soil	C-SP21-U	9/21/96	44.6	89.3	-50.01	-	5.48
raw soil	C-SP25-U	9/25/96	54.8	180.0	-69.56	-	1.29
raw soil	C-CO11-U	10/11/96	81.6	219.0	-62.75	7.47	9.14
Average Result			**51.2**	**148.2**	**-65.43**	**7.47**	**4.23**
coarse processed fraction	C-OC02-C	10/2/96	45.5	38.5	18.25	15.69	-
Average Result			**45.5**	**38.5**	**18.25**	**15.69**	**0.00**
fine processed fraction	C-OC02-F	10/2/96	340.4	265.0	28.44	80.20	-
Average Result			**340.4**	**265.0**	**28.44**	**80.20**	**0.00**
jig concentrate	C-OC03-M	10/3/96	40.9	53.6	-23.66	19.97	-
Average Result			**40.9**	**53.6**	**-23.66**	**19.97**	**0.00**
precipitate sludge	C-OC07-P	10/7/96	302.4	457.0	-33.82	41.51	-
Average Result			**302.4**	**457.0**	**-33.82**	**41.51**	**0.00**

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
11/15/96	T	B-NV15-T-W1	W	113.862	34.029	0.000	85.741	233.632
11/15/96	T	B-NV15-T-W2	W	50.213	0.000	0.000	0.000	50.213
11/16/96	T	B-NV16-T-W1	W	125.825	33.114	28.605	0.000	187.544
11/16/96	T	B-NV16-T-W2	W	29.627	0.000	0.000	0.000	29.627
11/16/96	T	B-NV16-T-W2-DUP	W	86.940	106.068	0.000	98.306	291.314
11/16/96	T	B-NV16-T-W3	W	113.560	51.430	26.087	64.713	255.790
11/16/96	T	B-NV16-T-W4	W	148.761	66.804	0.000	58.861	274.426
11/16/96	T	B-NV16-T-W5	W	140.502	71.281	0.000	55.546	267.329
11/16/96	T	B-NV16-T-W6	W	133.999	0.000	0.000	63.099	197.098
11/16/96	U	B-NV16-U-W1	W	135.728	0.000	40.797	0.000	176.525
11/16/96	U	B-NV16-U-W2	W	153.509	0.000	26.794	0.000	180.303
11/16/96	K	B-NV16-K-W1	W	58.880	0.000	24.744	0.000	83.624
11/16/96	K	B-NV16-K-W2	W	207.883	59.617	0.000	99.656	367.156
11/16/96	M	B-NV16-M-W1	W	110.253	0.000	0.000	49.016	159.269
11/16/96	M	B-NV16-M-W2	W	126.623	0.000	0.000	0.000	126.623
11/16/96	F	B-NV16-F-W1	W	226.050	33.878	0.000	91.329	351.258
11/16/96	F	B-NV16-F-W2	W	220.669	117.017	49.222	158.691	545.599
11/16/96	C	B-NV16-C-W1	W	59.561	0.000	0.000	0.000	59.561
11/19/96	P	B-NV19-P-W1	W	31136.200	3585.520	556.590	104.811	35383.121
11/19/96	P	B-NV19-P-W2	W	25919.200	3035.750	500.908	96.057	29551.915
11/20/96	T	B-NV20-T-W1	W	37.408	0.000	0.000	23.853	61.261
11/20/96	T	B-NV20-T-W2	W	56.578	65.914	68.091	45.731	236.314
11/20/96	T	B-NV20-T-W3	W	69.736	0.000	0.000	46.631	116.367
11/20/96	T	B-NV20-T-W4	W	89.270	0.000	0.000	67.801	157.071
11/20/96	T	B-NV20-T-W5	W	39.171	26.042	0.000	0.000	65.213
11/20/96	T	B-NV20-T-W6	W	39.602	0.000	29.043	0.000	68.645
11/20/96	C	B-NV20-C-W1	W	22.944	0.000	31.530	30.743	85.217
11/20/96	C	B-NV20-C-W2	W	58.832	0.000	0.000	30.785	89.616

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
11/20/96	C	B-NV20-C-W3	W	66.000	0.000	0.000	0.000	66.000
11/20/96	F	B-NV20-F-W1	W	145.154	81.198	0.000	124.506	350.858
11/20/96	F	B-NV20-F-W2	W	197.596	54.092	32.468	95.618	379.773
11/20/96	F	B-NV20-F-W3	W	224.905	65.530	54.620	65.806	410.861
11/20/96	K	B-NV20-K-W1	W	21.815	0.000	0.000	0.000	21.815
11/20/96	K	B-NV20-K-W2	W	75.573	29.731	0.000	34.785	140.088
11/20/96	K	B-NV20-K-W3	W	92.354	41.953	0.000	81.971	216.279
11/20/96	M	B-NV20-M-W1	W	30.183	0.000	0.000	0.000	30.183
11/20/96	M	B-NV20-M-W2	W	73.003	40.229	0.000	49.468	162.699
11/20/96	M	B-NV20-M-W3	W	106.235	0.000	0.000	0.000	106.235
11/20/96	P	B-NV20-P-W1	W	23872.900	2491.840	452.375	83.550	26900.665
11/20/96	P	B-NV20-P-W2	W	15593.600	1717.150	310.494	55.079	17676.323
11/20/96	P	B-NV20-P-W3	W	11134.500	942.371	225.242	61.190	12363.303
11/21/96	T	B-NV21-T-W1	W	100.303	0.000	30.871	108.575	239.749
11/21/96	T	B-NV21-T-W2	W	111.556	0.000	0.000	138.068	249.624
11/21/96	T	B-NV21-T-W3	W	72.030	0.000	26.063	59.168	157.261
11/21/96	T	B-NV21-T-W4	W	39.847	43.717	53.317	71.311	208.192
11/21/96	T	B-NV21-T-W5	W	119.102	35.840	37.692	46.316	238.949
11/21/96	T	B-NV21-T-W6	W	169.218	37.455	49.266	95.993	351.932
11/21/96	T	B-NV21-T-W7	W	69.149	0.000	21.074	90.839	181.062
11/21/96	T	B-NV21-T-W8	W	73.304	0.000	0.000	0.000	73.304
11/21/96	C	B-NV21-C-W1	W	67.746	0.000	0.000	0.000	67.746
11/21/96	C	B-NV21-C-W2	W	25.671	0.000	0.000	0.000	25.671
11/21/96	C	B-NV21-C-W3	W	43.027	0.000	0.000	0.000	43.027
11/21/96	F	B-NV21-F-W1	W	191.606	68.812	0.000	88.694	349.112
11/21/96	F	B-NV21-F-W1-DUP1	W	215.063	30.277	43.275	154.362	442.977
11/21/96	F	B-NV21-F-W1-DUP2	W	148.861	147.812	47.348	115.829	459.850
11/21/96	F	B-NV21-F-W2	W	173.289	85.920	36.247	97.320	392.776

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
11/21/96	F	B-NV21-F-W3	W	177.810	65.510	21.832	109.131	374.283
11/21/96	K	B-NV21-K-W1	W	67.714	66.224	43.331	0.000	177.268
11/21/96	K	B-NV21-K-W2	W	86.989	0.000	0.000	0.000	86.989
11/21/96	K	B-NV21-K-W3	W	136.645	0.000	0.000	66.154	202.799
11/21/96	M	B-NV21-M-W1	W	145.772	27.171	59.041	101.623	333.607
11/21/96	M	B-NV21-M-W2	W	115.677	0.000	0.000	79.250	194.927
11/21/96	M	B-NV21-M-W3	W	160.404	0.000	35.320	63.352	259.076
11/21/96	P	B-NV21-P-W1	W	3371.280	337.750	117.107	57.257	3883.394
11/21/96	P	B-NV21-P-W2	W	5323.910	434.823	147.147	35.648	5941.528
11/21/96	P	B-NV21-P-W3	W	19840.700	2489.640	461.057	71.675	22863.072
11/22/96	T	B-NV22-T-W1	W	126.114	54.807	21.518	102.663	305.102
11/22/96	T	B-NV22-T-W2	W	88.171	45.206	0.000	57.862	191.240
11/22/96	T	B-NV22-T-W3	W	107.625	56.911	0.000	77.393	241.929
11/22/96	T	B-NV22-T-W4	W	149.932	34.465	0.000	112.999	297.396
11/22/96	C	B-NV22-C-W1	W	65.278	0.000	0.000	26.854	92.131
11/22/96	C	B-NV22-C-W2	W	108.900	0.000	0.000	49.447	158.347
11/22/96	F	B-NV22-F-W1	W	227.953	39.873	0.000	149.017	416.843
11/22/96	F	B-NV22-F-W2	W	182.955	24.860	0.000	82.690	290.504
11/22/96	K	B-NV22-K-W1	W	47.828	0.000	0.000	0.000	47.828
11/22/96	K	B-NV22-K-W2	W	121.374	0.000	0.000	66.603	187.977
11/22/96	M	B-NV22-M-W1	W	182.114	0.000	0.000	86.253	268.367
11/22/96	M	B-NV22-M-W2	W	419.153	0.000	0.000	146.905	566.058
11/22/96	P	B-NV22-P-W1	W	5041.960	437.865	107.955	0.000	5587.780
11/22/96	P	B-NV22-P-W2	W	23956.500	2878.800	463.162	129.441	27427.903
11/23/96	T	B-NV23-T-W1	W	164.519	46.560	0.000	78.241	289.319
11/23/96	T	B-NV23-T-W2	W	142.753	47.279	0.000	112.247	302.279
11/23/96	T	B-NV23-T-W3	W	84.643	111.061	26.108	54.689	276.501
11/23/96	T	B-NV23-T-W4	W	159.568	0.000	0.000	72.029	231.597

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
11/23/96	T	B-NV23-T-W5	W	134.467	42.398	0.000	72.727	249.592
11/23/96	T	B-NV23-T-W6	W	170.709	38.782	0.000	76.916	286.407
11/23/96	C	B-NV23-C-W1	W	66.040	0.000	42.453	22.769	131.261
11/23/96	C	B-NV23-C-W2	W	74.060	0.000	0.000	74.222	148.282
11/23/96	F	B-NV23-F-W1	W	238.843	87.831	79.586	86.582	492.841
11/23/96	F	B-NV23-F-W2	W	233.771	72.781	56.386	180.042	542.980
11/23/96	K	B-NV23-K-W1	W	141.871	0.000	44.088	0.000	185.959
11/23/96	K	B-NV23-K-W2	W	226.408	0.000	0.000	42.795	269.203
11/23/96	M	B-NV23-M-W1	W	252.836	0.000	0.000	128.749	381.585
11/23/96	M	B-NV23-M-W2	W	293.771	0.000	0.000	114.720	408.491
11/23/96	P	B-NV23-P-W1	W	24332.900	2355.640	373.379	135.545	27197.464
11/23/96	P	B-NV23-P-W2	W	33626.000	2948.430	472.265	116.555	37163.250
11/25/96	T	B-NV25-T-W1	W	148.561	73.244	0.000	119.904	341.709
11/25/96	T	B-NV25-T-W2	W	143.880	49.643	0.000	117.107	310.630
11/25/96	T	B-NV25-T-W3	W	110.370	0.000	0.000	89.222	199.592
11/25/96	T	B-NV25-T-W4	W	95.047	0.000	0.000	78.098	173.145
11/25/96	T	B-NV25-T-W5	W	167.950	49.431	35.818	86.450	339.649
11/25/96	T	B-NV25-T-W6	W	161.976	41.288	25.262	101.451	329.976
11/25/96	T	B-NV25-T-D1	D	192.359	86.176	0.000	106.027	384.562
11/25/96	T	B-NV25-T-D2	D	202.844	0.000	0.000	129.621	332.465
11/25/96	T	B-NV25-T-D3	D	216.307	41.193	0.000	87.695	345.195
11/25/96	T	B-NV25-T-D4	D	212.038	67.492	33.638	108.536	421.704
11/25/96	T	B-NV25-T-D4-DUP	D	187.524	37.777	0.000	90.772	316.073
11/25/96	U	B-NV25-U-W1	W	352.248	34.568	0.000	92.542	479.358
11/25/96	U	B-NV25-U-W2	W	341.765	25.823	33.462	30.368	431.418
11/25/96	U	B-NV25-U-W3	W	382.289	55.521	0.000	0.000	437.810
11/25/96	U	B-NV25-U-W4	W	279.302	33.056	0.000	30.251	342.609
11/25/96	C	B-NV25-C-W1	W	122.285	0.000	0.000	37.383	159.668

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
11/25/96	C	B-NV25-C-W2	W	70.968	0.000	0.000	0.000	70.968
11/25/96	C	B-NV25-C-W3	W	76.525	0.000	0.000	0.000	76.525
11/25/96	F	B-NV25-F-W1	W	297.010	0.000	0.000	161.003	458.013
11/25/96	F	B-NV25-F-W2	W	216.689	76.318	0.000	141.678	434.685
11/25/96	K	B-NV25-K-W1	W	226.806	130.276	0.000	165.365	522.447
11/25/96	K	B-NV25-K-W2	W	96.176	0.000	0.000	0.000	96.176
11/25/96	M	B-NV25-M-W1	W	225.665	0.000	0.000	78.578	304.243
11/25/96	P	B-NV25-P-W1	W	33074.200	3403.610	541.951	100.825	37120.586
11/25/96	P	B-NV25-P-W2	W	35028.400	3147.680	457.028	138.939	38772.047
11/25/96	P	B-NV25-P-W3	W	24363.400	1466.090	301.652	120.892	26252.034
11/25/96	P	B-NV25-P-D1	D	34021.100	2467.200	475.743	217.838	37181.881
11/25/96	P	B-NV25-P-D2	D	31678.800	2621.580	441.486	107.254	34849.120
11/25/96	P	B-NV25-P-D3	D	32979.500	2340.600	502.211	203.161	36025.472
11/26/96	T	B-NV26-T-W1	W	120.042	62.636	0.000	66.131	248.809
11/26/96	T	B-NV26-T-W2	W	172.275	0.000	0.000	149.699	321.974
11/26/96	T	B-NV26-T-W3	W	52.712	0.000	0.000	30.081	82.793
11/26/96	T	B-NV26-T-W4	W	31.445	0.000	29.849	0.000	61.294
11/26/96	T	B-NV26-T-W5	W	190.500	85.551	28.834	164.005	468.890
11/26/96	T	B-NV26-T-W6	W	163.408	77.594	38.402	166.371	445.775
11/26/96	U	B-NV26-U-W1	W	379.051	0.000	30.876	55.472	465.399
11/26/96	U	B-NV26-U-W2	W	369.297	0.000	0.000	23.975	393.272
11/26/96	C	B-NV26-C-W1	W	70.358	0.000	0.000	0.000	70.358
11/26/96	C	B-NV26-C-W2	W	95.996	0.000	0.000	0.000	95.996
11/26/96	C	B-NV26-C-W3	W	86.972	0.000	0.000	73.508	160.480
11/26/96	F	B-NV26-F-W1	W	205.708	83.199	0.000	129.221	418.128
11/26/96	F	B-NV26-F-W2	W	159.537	33.225	35.727	84.278	312.767
11/26/96	F	B-NV26-F-W3	W	213.548	81.646	43.314	141.836	480.344
11/26/96	K	B-NV26-K-W1	W	45.115	0.000	0.000	87.682	132.797

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
11/26/96	K	B-NV26-K-W2	W	146.487	0.000	0.000	50.662	197.149
11/26/96	P	B-NV26-P-W1	W	37124.200	2516.630	427.670	239.257	40307.757
11/26/96	P	B-NV26-P-W2	W	33406.600	2351.810	421.132	241.027	36420.569
11/27/96	T	B-NV27-T-W1	W	106.992	52.671	0.000	76.859	236.522
11/27/96	T	B-NV27-T-W2	W	102.391	0.000	0.000	36.676	139.067
11/27/96	T	B-NV27-T-W3	W	124.237	31.969	27.033	118.869	302.108
11/27/96	T	B-NV27-T-W4	W	139.327	25.838	45.201	70.284	280.650
11/27/96	T	B-NV27-T-W5	W	94.311	57.287	0.000	30.431	182.028
11/27/96	T	B-NV27-T-W6	W	70.391	0.000	25.018	38.437	133.846
11/27/96	C	B-NV27-C-W1	W	71.084	0.000	0.000	0.000	71.084
11/27/96	C	B-NV27-C-W2	W	52.893	0.000	0.000	0.000	52.893
11/27/96	C	B-NV27-C-W3	W	89.071	0.000	0.000	47.104	136.175
11/27/96	F	B-NV27-F-W1	W	268.462	0.000	48.759	40.982	358.203
11/27/96	F	B-NV27-F-W2	W	165.072	0.000	0.000	55.616	220.688
11/27/96	F	B-NV27-F-W3	W	178.046	36.846	41.649	60.785	317.326
11/27/96	K	B-NV27-K-W1	W	152.551	0.000	41.897	43.621	238.069
11/27/96	K	B-NV27-K-W2	W	128.443	0.000	57.882	62.487	248.812
11/27/96	K	B-NV27-K-W3	W	77.521	30.083	45.628	50.723	203.955
11/27/96	P	B-NV27-P-W1	W	27789.400	2159.110	389.456	251.315	30589.281
11/27/96	P	B-NV27-P-W2	W	32779.100	2200.960	407.568	186.722	35574.350
11/27/96	P	B-NV27-P-W3	W	44324.700	3962.450	773.362	286.078	49346.590
11/29/96	T	B-NV29-T-W1	W	163.556	50.676	28.140	128.873	371.245
11/29/96	T	B-NV29-T-W2	W	143.141	45.082	50.867	161.053	400.142
11/29/96	T	B-NV29-T-W3	W	184.925	83.396	39.537	76.496	384.354
11/29/96	T	B-NV29-T-W4	W	149.966	61.864	0.000	115.722	327.552
11/29/96	T	B-NV29-T-D1	D	243.087	61.298	0.000	139.672	444.057
11/29/96	T	B-NV29-T-D2	D	230.894	97.023	0.000	174.342	502.259
11/29/96	T	B-NV29-T-D3	D	222.788	38.609	20.300	153.873	435.570

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
11/30/96	T	B-NV30-T-W2	W	132.456	31.026	0.000	91.347	254.829
11/30/96	T	B-NV30-T-W3	W	116.007	42.566	25.052	65.915	249.541
11/30/96	T	B-NV30-T-W4	W	174.221	44.758	28.791	122.519	370.289
11/30/96	T	B-NV30-T-D1	D	221.743	105.319	0.000	116.233	443.295
11/30/96	T	B-NV30-T-D2	D	200.772	67.893	0.000	92.383	361.048
11/30/96	T	B-NV30-T-D3	D	179.406	59.886	0.000	81.455	320.747
11/30/96	T	B-NV30-T-D4	D	202.199	64.197	0.000	154.786	421.182
12/2/96	T	B-DC02-T-W1	W	128.933	33.511	0.000	103.535	265.979
12/2/96	T	B-DC02-T-W2	W	92.870	0.000	0.000	72.023	164.893
12/2/96	T	B-DC02-T-W3	W	98.148	0.000	0.000	110.501	208.649
12/2/96	T	B-DC02-T-W4	W	119.030	46.921	37.825	80.707	284.483
12/2/96	C	B-DC02-C-W1	W	26.781	0.000	0.000	54.532	81.313
12/2/96	C	B-DC02-C-W2	W	27.982	0.000	0.000	0.000	27.982
12/2/96	F	B-DC02-F-W1	W	177.506	59.792	0.000	158.166	395.464
12/2/96	F	B-DC02-F-W2	W	199.631	55.242	0.000	158.806	413.679
12/2/96	K	B-DC02-K-W1	W	93.912	0.000	0.000	48.814	142.725
12/2/96	K	B-DC02-K-W2	W	107.552	0.000	41.671	30.238	179.460
12/2/96	P	B-DC02-P-W1	W	15572.100	1179.850	254.996	0.000	17006.946
12/2/96	P	B-DC02-P-W2	W	15805.400	1217.580	298.136	98.274	17419.390
12/3/96	T	B-DC03-T-W1	W	150.235	0.000	0.000	68.512	218.747
12/3/96	T	B-DC03-T-W2	W	104.527	0.000	25.809	0.000	130.336
12/3/96	T	B-DC03-T-W3	W	121.682	0.000	73.319	57.381	252.382
12/3/96	T	B-DC03-T-W4	W	98.065	0.000	0.000	0.000	98.065
12/3/96	T	B-DC03-T-W5	W	105.550	26.370	0.000	47.783	179.702
12/3/96	T	B-DC03-T-W6	W	87.644	0.000	0.000	42.370	130.014
12/3/96	C	B-DC03-C-W1	W	40.545	0.000	25.780	0.000	66.325
12/3/96	C	B-DC03-C-W2	W	36.851	0.000	0.000	0.000	36.851
12/3/96	F	B-DC03-F-W1	W	145.048	101.452	22.108	147.616	416.224

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
12/3/96	F	B-DC03-F-W2	W	191.260	72.851	48.280	146.935	459.326
12/3/96	K	B-DC03-K-W1	W	1581.210	100.575	40.150	241.395	1963.330
12/3/96	K	B-DC03-K-W2	W	1577.990	0.000	29.730	261.278	1868.998
12/3/96	P	B-DC03-P-W1	W	42679.600	3986.440	724.280	256.783	47647.103
12/3/96	P	B-DC03-P-W2	W	42399.900	3956.640	640.157	222.774	47219.471
12/3/96	-	LEAD-METALS	D	60888.700	101668.000	9299.050	4341.930	176197.680
12/4/96	T	B-DC04-T-W1	W	54.472	0.000	26.240	29.329	110.042
12/4/96	T	B-DC04-T-W2	W	77.038	0.000	37.031	40.222	154.291
12/4/96	T	B-DC04-T-W3	W	82.384	0.000	35.811	73.999	192.194
12/4/96	T	B-DC04-T-W4	W	94.387	32.909	0.000	24.373	151.669
12/4/96	T	B-DC04-T-W5	W	71.588	0.000	0.000	0.000	71.588
12/4/96	T	B-DC04-T-W6	W	86.389	58.935	0.000	30.699	176.022
12/4/96	C	B-DC04-C-W1	W	44.428	0.000	0.000	0.000	44.428
12/4/96	C	B-DC04-C-W2	W	91.526	0.000	0.000	0.000	91.526
12/4/96	C	B-DC04-C-W3	W	83.868	0.000	30.131	0.000	113.999
12/4/96	C	B-DC04-C-D1	D	97.134	0.000	0.000	0.000	97.134
12/4/96	C	B-DC04-C-D2	D	79.165	0.000	0.000	84.215	163.381
12/4/96	F	B-DC04-F-W1	W	111.430	41.040	39.428	44.118	236.016
12/4/96	F	B-DC04-F-W2	W	113.340	0.000	65.756	75.609	254.705
12/4/96	F	B-DC04-F-W3	W	93.049	0.000	0.000	73.389	166.437
12/4/96	K	B-DC04-K-W1	W	42.183	39.784	61.676	48.747	192.390
12/4/96	K	B-DC04-K-W2	W	75.074	0.000	55.946	61.030	192.050
12/4/96	K	B-DC04-K-W3	W	112.219	0.000	0.000	0.000	112.219
12/4/96	K	B-DC04-K-D1	D	585.564	0.000	0.000	60.651	646.215
12/4/96	K	B-DC04-K-D2	D	882.012	0.000	0.000	77.237	959.249
12/4/96	P	B-DC04-P-W1	W	44447.000	3777.060	657.750	358.803	49240.613
12/4/96	P	B-DC04-P-W2	W	42818.900	3569.260	527.092	211.280	47126.532
12/4/96	P	B-DC04-P-W3	W	42374.900	3538.550	592.265	245.375	46751.090

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
12/5/96	T	B-DC05-T-W1	W	146.958	0.000	43.182	122.192	312.332
12/5/96	T	B-DC05-T-W2	W	119.725	35.598	33.369	92.582	281.274
12/5/96	T	B-DC05-T-W3	W	75.403	0.000	30.937	59.207	165.547
12/5/96	T	B-DC05-T-W4	W	89.801	45.449	33.350	82.716	251.316
12/5/96	T	B-DC05-T-W5	W	88.006	0.000	42.804	79.591	210.401
12/5/96	T	B-DC05-T-W6	W	58.627	37.329	0.000	0.000	95.956
12/5/96	C	B-DC05-C-W1	W	57.931	0.000	0.000	23.210	81.141
12/5/96	C	B-DC05-C-W2	W	102.930	0.000	0.000	49.283	152.213
12/5/96	C	B-DC05-C-W3	W	35.146	0.000	0.000	0.000	35.146
12/5/96	F	B-DC05-F-W1	W	91.783	38.484	52.901	81.346	264.514
12/5/96	F	B-DC05-F-W2	W	97.125	28.271	42.945	79.391	247.733
12/5/96	F	B-DC05-F-W3	W	129.369	39.122	21.582	98.515	288.588
12/5/96	K	B-DC05-K-W1	W	351.459	0.000	0.000	44.276	395.735
12/5/96	P	B-DC05-P-W1	W	31113.800	2532.550	515.930	240.721	34403.001
12/5/96	P	B-DC05-P-W2	W	30939.000	2549.070	516.954	144.903	34149.927
12/5/96	P	B-DC05-P-W3	W	30454.800	2602.560	430.851	178.015	33666.226
12/6/96	T	B-DC06-T-W1	W	94.300	0.000	30.413	63.044	187.756
12/6/96	T	B-DC06-T-W2	W	121.953	61.801	0.000	101.754	285.508
12/6/96	T	B-DC06-T-W3	W	89.503	0.000	36.016	162.486	288.006
12/6/96	T	B-DC06-T-W4	W	91.170	26.959	46.728	112.317	277.174
12/6/96	T	B-DC06-T-W5	W	87.777	51.741	0.000	72.323	211.840
12/6/96	T	B-DC06-T-W5-DUP	W	67.599	42.982	21.523	74.697	206.802
12/6/96	C	B-DC06-C-W1	W	55.198	0.000	0.000	49.552	104.749
12/6/96	C	B-DC06-C-W2	W	83.268	0.000	0.000	51.201	134.469
12/6/96	C	B-DC06-C-W3	W	29.810	26.019	23.674	0.000	79.503
12/6/96	F	B-DC06-F-W1	W	145.412	0.000	32.885	136.845	315.142
12/6/96	F	B-DC06-F-W2	W	108.905	0.000	26.722	71.164	206.790
12/6/96	F	B-DC06-F-W3	W	78.516	72.525	32.697	84.215	267.952

Table H-6. XRF Data for Vendor 2

Date	Process Stream	Sample No.	XRF Basis (Wet/Dry)	XRF Lead (mg/kg)	XRF Cu (mg/kg)	XRF Zn (mg/kg)	XRF Sb (mg/kg)	XRF Totals (mg/kg)
12/6/96	K	B-DC06-K-W1	W	108.747	0.000	28.045	0.000	136.792
12/6/96	K	B-DC06-K-W2	W	97.572	0.000	0.000	24.330	121.902
12/6/96	K	B-DC06-K-W3	W	94.670	0.000	20.266	0.000	114.935
12/6/96	P	B-DC06-P-W1	W	26723.700	2122.290	424.966	180.410	29451.366
12/6/96	P	B-DC06-P-W2	W	26667.900	2026.100	455.526	181.425	29330.951
12/6/96	P	B-DC06-P-W3	W	26171.800	2018.250	403.056	92.738	28685.844

Table H-7. Comparison of XRF and ICP Data for Lead : Vendor 2

Stream	Stream ID	Date	Average Lead Result by XRF (mg/kg)	Average Lead Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	B-NV15-T	11/15/96	82.0	143.5	-42.8	45.01	27.58
processed soil	B-NV16-T	11/16/96	120.2	178.5	-32.7	32.64	0.71
processed soil	B-NV20-T	11/20/96	55.3	125.5	-55.9	20.93	4.95
processed soil	B-NV21-T	11/21/96	94.3	134.0	-29.6	39.81	5.66
processed soil	B-NV22-T	11/22/96	118.0	114.5	3.0	26.35	0.71
processed soil	B-NV23-T	11/23/96	142.8	232.0	-38.5	31.57	8.49
processed soil	B-NV25-T	11/25/96	138.0	234.5	-41.2	29.07	7.78
processed soil	B-NV26-T	11/26/96	121.7	181.0	-32.7	66.24	1.41
processed soil	B-NV27-T	11/27/96	106.3	165.0	-35.6	23.92	0.00
processed soil	B-NV29-T	11/29/96	160.4	230.0	-30.3	18.42	4.24
processed soil	B-NV30-T	11/30/96	140.9	233.0	-39.5	30.01	0.00
processed soil	B-DC02-T	12/2/96	109.7	177.5	-38.2	17.07	14.85
processed soil	B-DC03-T	12/3/96	111.3	131.5	-15.4	22.08	4.95
processed soil	B-DC04-T	12/4/96	77.7	113.0	-31.2	13.81	2.84
processed soil	B-DC05-T	12/5/96	96.4	127.0	-24.1	31.88	2.84
processed soil	B-DC06-T	12/6/96	94.9	123.0	-22.8	16.37	2.84
Average Result			**110.6**	**165.2**	**-33.0**	**29.07**	**5.61**
raw soil	B-NV16-U	11/16/96	144.6	4,819	-97.0	12.57	142.13
raw soil	B-NV25-U	11/25/96	338.9	5,194	-93.5	43.29	46.77
raw soil	B-NV26-U	11/26/96	374.2	5,041	-92.6	6.90	16.33
Average Result			**285.9**	**5,018**	**-94.3**	**20.92**	**68.41**
feed to jig	B-NV22-K	11/22/96	84.6	359.5	-76.5	52.01	45.96
feed to jig	B-DC05-K	12/5/96	351.5	1,250	-71.9	-	37.48
Average Result			**218.0**	**804.5**	**-72.9**	**52.01**	**41.72**
coarse processed fraction	B-NV22-C	11/22/96	87.1	135.0	-35.5	30.85	7.07
coarse processed fraction	B-DC05-C	12/5/96	65.3	215.5	-69.7	34.49	23.33
Average Result			**76.2**	**175.3**	**-56.5**	**32.67**	**15.20**
fine processed fraction	B-DC02-F	12/2/96	188.6	175.0	7.8	15.65	3.32
fine processed fraction	B-DC06-F	12/6/96	110.9	150.5	-26.3	33.50	6.36
Average Result			**149.8**	**162.8**	**-8.0**	**24.57**	**4.84**
jig concentrate	B-NV22-M	11/22/96	300.6	1,644	-81.7	167.61	11.24
Average Result			**300.6**	**1,644**	**-81.7**	**167.61**	**11.24**
precipitate sludge	B-NV25-P	11/25/96	30,822	16,455	87.3	5,678	457.50
precipitate sludge	B-DC06-P	12/6/96	26,521	21,571	22.9	303.82	1,208
Average Result			**28,672**	**19,013**	**50.8**	**2,991**	**832.94**

Table H-8. Comparison of XRF and ICP Data for Copper : Vendor 2

Stream	Stream ID	Date	Average Copper Result by XRF (mg/kg)	Average Copper Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	B-NV15-T	11/15/96	17.0	50.0	193.9	24.06	27.58
processed soil	B-NV16-T	11/16/96	54.8	48.6	-11.3	27.05	0.71
processed soil	B-NV20-T	11/20/96	15.3	54.1	253.0	26.88	4.95
processed soil	B-NV21-T	11/21/96	14.6	60.3	312.3	20.31	5.66
processed soil	B-NV22-T	11/22/96	47.8	62.9	31.5	10.27	0.71
processed soil	B-NV23-T	11/23/96	47.7	70.7	48.3	35.77	8.49
processed soil	B-NV25-T	11/25/96	35.6	81.2	128.1	29.57	7.78
processed soil	B-NV26-T	11/26/96	37.6	51.5	36.9	41.87	1.41
processed soil	B-NV27-T	11/27/96	28.0	63.1	125.7	24.72	0.00
processed soil	B-NV29-T	11/29/96	60.3	85.3	41.6	16.93	4.24
processed soil	B-NV30-T	11/30/96	39.5	62.5	58.4	7.37	0.00
processed soil	B-DC02-T	12/2/96	20.1	53.3	165.1	23.86	14.85
processed soil	B-DC03-T	12/3/96	4.4	48.1	994.4	10.77	4.95
processed soil	B-DC04-T	12/4/96	15.3	54.2	254.1	25.10	2.84
processed soil	B-DC05-T	12/5/96	19.7	57.8	193.0	21.87	2.84
processed soil	B-DC06-T	12/6/96	28.1	50.2	78.6	28.61	2.84
Average Result			**30.4**	**59.6**	**96.3**	**23.44**	**5.61**
raw soil	B-NV16-U	11/16/96	0.0	2,301	-	0.00	49.83
raw soil	B-NV25-U	11/25/96	37.2	2,456	6,493	12.71	36.24
raw soil	B-NV26-U	11/26/96	0.0	2,461	-	0.00	19.61
Average Result			**12.4**	**2,406**	**19,280**	**4.24**	**35.23**
feed to jig	B-NV22-K	11/22/96	0.0	277.0	-	0.00	45.96
feed to jig	B-DC05-K	12/5/96	0.0	418.0	-	-	37.48
Average Result			**0.0**	**347.5**	-	-	**41.72**
coarse processed fraction	B-NV22-C	11/22/96	0.0	111.0	-	0.00	7.07
coarse processed fraction	B-DC05-C	12/5/96	0.0	114.0	-	0.00	23.33
Average Result			**0.0**	**112.5**	-	**0.00**	**15.20**
fine processed fraction	B-DC02-F	12/2/96	57.5	82.5	43.4	3.22	-
fine processed fraction	B-DC06-F	12/6/96	24.2	88.5	266.1	41.87	-
Average Result			**40.8**	**85.5**	**109.3**	**22.54**	-
jig concentrate	B-NV22-M	11/22/96	0.0	99.1	-	0.00	-
Average Result			**0.0**	**99.1**	-	**0.00**	-
precipitate sludge	B-NV25-P	11/25/96	2,672	4,262	59.5	1,053	-
precipitate sludge	B-DC06-P	12/6/96	2,056	8,828	329.5	57.93	-
Average Result			**2,364**	**6,545**	**176.9**	**555.24**	-

Table H-9. Comparison of XRF and ICP Data for Zinc : Vendor 2

Stream	Stream ID	Date	Average Zinc Result by XRF (mg/kg)	Average Zinc Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	B-NV15-T	11/15/96	0.0	17.7	-	0.00	0.21
processed soil	B-NV16-T	11/16/96	9.1	14.3	56.9	14.14	0.42
processed soil	B-NV20-T	11/20/96	16.2	17.0	5.0	27.95	0.99
processed soil	B-NV21-T	11/21/96	31.2	18.5	-40.8	18.07	0.49
processed soil	B-NV22-T	11/22/96	5.4	21.2	294.1	10.76	0.14
processed soil	B-NV23-T	11/23/96	4.4	19.6	349.3	10.66	0.49
processed soil	B-NV25-T	11/25/96	10.2	23.2	127.4	16.12	0.92
processed soil	B-NV26-T	11/26/96	16.2	14.8	-8.5	18.03	0.42
processed soil	B-NV27-T	11/27/96	16.2	16.4	1.2	19.09	0.85
processed soil	B-NV29-T	11/29/96	29.6	22.0	-25.9	21.83	0.21
processed soil	B-NV30-T	11/30/96	17.9	14.9	-17.3	15.66	0.35
processed soil	B-DC02-T	12/2/96	9.5	13.4	41.7	18.91	0.57
processed soil	B-DC03-T	12/3/96	16.5	14.1	-15.0	29.68	1.48
processed soil	B-DC04-T	12/4/96	16.5	15.2	-8.0	18.47	2.26
processed soil	B-DC05-T	12/5/96	27.0	16.2	-40.0	15.87	1.98
processed soil	B-DC06-T	12/6/96	2.6	16.7	534.6	21.48	0.28
Average Result			**14.3**	**17.2**	**20.3**	**17.30**	**0.76**
raw soil	B-NV16-U	11/16/96	33.8	181.8	438.0	9.90	5.42
raw soil	B-NV25-U	11/25/96	8.4	192.7	2,204	16.73	3.49
raw soil	B-NV26-U	11/26/96	15.4	189.8	1,129.2	21.83	0.96
Average Result			**19.2**	**188.1**	**879.8**	**16.15**	**3.29**
feed to jig	B-NV22-K	11/22/96	0.0	38.0	-	0.00	37.97
feed to jig	B-DC05-K	12/5/96	0.0	16.1	-	-	16.12
Average Result			**0.0**	**27.0**	-	-	**27.05**
coarse processed fraction	B-NV22-C	11/22/96	0.0	14.3	-	0.00	14.28
coarse processed fraction	B-DC05-C	12/5/96	0.0	13.4	-	0.00	3.89
Average Result			**0.0**	**13.8**	-	**0.00**	**9.09**
fine processed fraction	B-DC02-F	12/2/96	0.0	23.4	-	0.00	-
fine processed fraction	B-DC06-F	12/6/96	30.8	20.7	-32.7	3.51	-
Average Result			**15.4**	**22.1**	**43.3**	**1.75**	-
jig concentrate	B-NV22-M	11/22/96	0.0	15.8	-	0.00	11.24
Average Result			**0.0**	**15.8**	-	**0.00**	**11.24**
precipitate sludge	B-NV25-P	11/25/96	433.5	689.0	58.9	121.86	-
precipitate sludge	B-DC06-P	12/6/96	427.8	1,462	241.7	26.35	-
Average Result			**430.7**	**1,076**	**149.7**	**74.11**	-

Table H-10. Comparison of XRF and ICP Data for Antimony : Vendor 2

Stream	Stream ID	Date	Average Antimony Result by XRF (mg/kg)	Average Antimony Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	B-NV15-T	11/15/96	42.9	56.1	30.9	60.63	0.14
processed soil	B-NV16-T	11/16/96	55.9	64.5	15.3	30.54	1.56
processed soil	B-NV20-T	11/20/96	30.7	54.0	76.1	27.52	1.98
processed soil	B-NV21-T	11/21/96	76.3	80.3	5.2	42.25	0.92
processed soil	B-NV22-T	11/22/96	87.7	89.0	1.4	24.90	3.46
processed soil	B-NV23-T	11/23/96	77.8	105.4	35.5	18.87	1.27
processed soil	B-NV25-T	11/25/96	98.7	115.2	16.7	17.09	1.41
processed soil	B-NV26-T	11/26/96	96.0	73.6	-23.4	73.37	0.99
processed soil	B-NV27-T	11/27/96	61.9	77.9	25.7	33.81	1.63
processed soil	B-NV29-T	11/29/96	120.5	127.8	6.0	34.99	3.82
processed soil	B-NV30-T	11/30/96	93.3	93.5	0.3	28.35	3.26
processed soil	B-DC02-T	12/2/96	91.7	65.5	-28.6	18.27	1.70
processed soil	B-DC03-T	12/3/96	36.0	68.7	90.7	29.28	2.19
processed soil	B-DC04-T	12/4/96	33.1	65.1	96.5	24.15	1.63
processed soil	B-DC05-T	12/5/96	72.7	77.5	6.5	41.13	0.92
processed soil	B-DC06-T	12/6/96	102.4	88.8	-13.3	39.25	1.56
Average Result			73.6	81.4	10.6	34.03	1.78
raw soil	B-NV16-U	11/16/96	0.0	254.5	-	0.00	8.74
raw soil	B-NV25-U	11/25/96	38.3	262.1	584.6	47.17	6.34
raw soil	B-NV26-U	11/26/96	39.7	247.8	523.7	22.27	0.79
Average Result			26.0	254.8	879.9	23.15	5.29
feed to jig	B-NV22-K	11/22/96	33.3	29.1	-12.6	47.10	1.70
feed to jig	B-DC05-K	12/5/96	44.3	110.6	149.7	-	9.83
Average Result			38.8	69.8	80.0	23.55	5.76
coarse processed fraction	B-NV22-C	11/22/96	38.2	110.8	190.3	15.98	1.98
coarse processed fraction	B-DC05-C	12/5/96	24.2	32.3	33.5	24.66	0.21
Average Result			31.2	71.5	129.5	20.32	1.10
fine processed fraction	B-DC02-F	12/2/96	158.5	94.3	-40.5	0.45	-
fine processed fraction	B-DC06-F	12/6/96	97.4	105.0	7.8	34.77	-
Average Result			127.9	99.7	-22.1	17.61	0.00
jig concentrate	B-NV22-M	11/22/96	116.6	208.0	78.4	42.89	-
Average Result			116.6	208.0	78.4	42.89	0.00
precipitate sludge	B-NV25-P	11/25/96	120.2	309.0	157.0	19.07	-
precipitate sludge	B-DC06-P	12/6/96	151.5	478.0	215.5	48.66	-
Average Result			135.9	393.5	189.6	33.87	0.00

Table H-9. Comparison of XRF and ICP Data for Zinc : Vendor 2

Stream	Stream ID	Date	Average Zinc Result by XRF (mg/kg)	Average Zinc Result by ICP (mg/kg)	Percent Difference (%)	Standard Deviation of XRF Result (mg/kg)	Standard Deviation of ICP Result (mg/kg)
processed soil	B-NV15-T	11/15/96	0.0	17.7	-	0.00	0.21
processed soil	B-NV16-T	11/16/96	9.1	14.3	56.9	14.14	0.42
processed soil	B-NV20-T	11/20/96	16.2	17.0	5.0	27.95	0.99
processed soil	B-NV21-T	11/21/96	31.2	18.5	-40.8	18.07	0.49
processed soil	B-NV22-T	11/22/96	5.4	21.2	294.1	10.76	0.14
processed soil	B-NV23-T	11/23/96	4.4	19.6	349.3	10.66	0.49
processed soil	B-NV25-T	11/25/96	10.2	23.2	127.4	16.12	0.92
processed soil	B-NV26-T	11/26/96	16.2	14.8	-8.5	18.03	0.42
processed soil	B-NV27-T	11/27/96	16.2	16.4	1.2	19.09	0.85
processed soil	B-NV29-T	11/29/96	29.6	22.0	-25.9	21.83	0.21
processed soil	B-NV30-T	11/30/96	17.9	14.9	-17.3	15.66	0.35
processed soil	B-DC02-T	12/2/96	9.5	13.4	41.7	18.91	0.57
processed soil	B-DC03-T	12/3/96	16.5	14.1	-15.0	29.68	1.48
processed soil	B-DC04-T	12/4/96	16.5	15.2	-8.0	18.47	2.26
processed soil	B-DC05-T	12/5/96	27.0	16.2	-40.0	15.87	1.98
processed soil	B-DC06-T	12/6/96	2.6	16.7	534.6	21.48	0.28
Average Result			**14.3**	**17.2**	**20.3**	**17.30**	**0.76**
raw soil	B-NV16-U	11/16/96	33.8	181.8	438.0	9.90	5.42
raw soil	B-NV25-U	11/25/96	8.4	192.7	2,204	16.73	3.49
raw soil	B-NV26-U	11/26/96	15.4	189.8	1,129.2	21.83	0.96
Average Result			**19.2**	**188.1**	**879.8**	**16.15**	**3.29**
feed to jig	B-NV22-K	11/22/96	0.0	38.0	-	0.00	37.97
feed to jig	B-DC05-K	12/5/96	0.0	16.1	-	-	16.12
Average Result			**0.0**	**27.0**	-	-	**27.05**
coarse processed fraction	B-NV22-C	11/22/96	0.0	14.3	-	0.00	14.28
coarse processed fraction	B-DC05-C	12/5/96	0.0	13.4	-	0.00	3.89
Average Result			**0.0**	**13.8**	-	**0.00**	**9.09**
fine processed fraction	B-DC02-F	12/2/96	0.0	23.4	-	0.00	-
fine processed fraction	B-DC06-F	12/6/96	30.8	20.7	-32.7	3.51	-
Average Result			**15.4**	**22.1**	**43.3**	**1.75**	-
jig concentrate	B-NV22-M	11/22/96	0.0	15.8	-	0.00	11.24
Average Result			**0.0**	**15.8**	-	**0.00**	**11.24**
precipitate sludge	B-NV25-P	11/25/96	433.5	689.0	58.9	121.86	-
precipitate sludge	B-DC06-P	12/6/96	427.8	1,462	241.7	26.35	-
Average Result			**430.7**	**1,076**	**149.7**	**74.11**	-

APPENDIX I

Cost Data

The cost data generated for the acetic acid and hydrochloric acid demonstrations given in Tables 7-12, 7-13, 7-14, and 8-1 were obtained from information provided by the site support contractor, the individual vendor reports submitted, and the sampling and analytical costs incurred by Battelle. In addition, Battelle received residuals disposal cost reports from the second vendor and the disposal facility used by the first vendor.

Fort Polk, LA

Site Description: Small-arms ranges at Fort Polk, LA are contaminated with particulate and absorbed lead, and other various metals.

Site Type: Small-arms Range

Contaminants, Media: Lead, Copper, Zinc, and Antimony.

Depth to Groundwater: feet

Other Costs: Site preparation and sampling and analytical costs are also factored into the overall treatment cost.

Schedule/Duration: 1/1/98 through 3/1/98 2 Week Start Up Period 1 Month O&M Period

Type of Work: RI/FS or RFI/CMS? No Remedial Design? No Remedial Action? Yes

Treatments/Processes: 10,000 tons of contaminated soil will be screened and the remaining soil will be transported to a landfill for stabilization and disposal in the landfill.

Contractor Costs / General Conditions	$275,143.99	Permitting and regulatory, site characterization, vendor selection, site preparation and support, engineering and administrative, transportation, on-site mobilization, and decontamination and demobilization.
Landfill Disposal	$1,988,663.78	Equipment, effluent treatment, utilities, and site excavation/hauling
Professional Labor	$60,925.20	Labor
Sampling and Analysis	$32,995.98	Sampling and Analysis
Total Cost for the Site:	$2,357,728.95	

Landfill Disposal

Battelle Memorial Institute
5/15/97

This process will use excavation equipment to remove 10,000 tons of contaminated soil from a small-arms range, after which it will be screened to remove particulate metals. The remaining soil will then be transported where it will be disposed of as hazardous waste in a landfill. The screened metals will be transported to a smelter for recycling.

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Fort Polk, LA

Small-arms ranges at Fort Polk, LA are contaminated with particulate and absorbed lead, and other various metals.

Lead, Copper, Zinc, and Antimony.

10,000 tons of contaminated soil will be screened and the remaining soil will be transported to a landfill for stabilization and disposal in the landfill.

Site preparation and sampling and analytical costs are also factored into the overall treatment cost.

Contractor Costs / General Conditions

Permitting and regulatory, site characterization, vendor selection, site preparation and support, engineering and administrative, transportation, on-site mobilization, and decontamination and demobilization.

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Site Preparation and Support, Operations Pad Construction	1.00 EACH		*$0.0000*	*$1,817.0000*	*$13,075.3000*	
17030201		D	70.00%	100.00%		
			$0.00	**$1,817.00**	**$13,075.30**	**$14,892.30**
Consumables and supplies	1.00 EACH		*$0.0000*	*$0.0000*	*$12,024.0000*	
33010404		D	70.00%	100.00%		
			$0.00	**$0.00**	**$12,024.00**	**$12,024.00**
Consumables and supplies - Diesel Fuel	500.00 GAL		*$0.0000*	*$0.0000*	*$1.4500*	
33420201		D	70.00%	100.00%		
			$0.00	**$0.00**	**$725.00**	**$725.00**
Vendor Selection	1.00 LOC		*$25,000.0000*	*$0.0000*	*$0.0000*	
99030501		D	100.00%	100.00%		
			$25,000.00	**$0.00**	**$0.00**	**$25,000.00**
Permitting and Regulatory	1.00 Locat		*$73,199.0000*	*$0.0000*	*$0.0000*	
99030602		D	100.00%	100.00%		
			$73,199.00	**$0.00**	**$0.00**	**$73,199.00**

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Engineering and Administrative	1.00 EACH		*$12,000.0000*	*$0.0000*	*$0.0000*	
99040101		D	100.00%	100.00%		
			$12,000.00	**$0.00**	**$0.00**	**$12,000.00**
Site Preparation and Support - Temporary Office 32' x 8'	1.00 MONTH		*$0.0000*	*$0.0000*	*$318.6500*	
99040102		D	70.00%	100.00%		
			$0.00	**$0.00**	**$318.65**	**$318.65**
Site Preparation and Support - Construction Signs	5.00 SF		*$0.0000*	*$0.0000*	*$13.2500*	
99040401		D	70.00%	100.00%		
			$0.00	**$0.00**	**$66.25**	**$66.25**
Site Preparation and Support - Portable Toilets	1.00 MONTH		*$0.0000*	*$0.0000*	*$122.8000*	
99040501		D	70.00%	100.00%		
			$0.00	**$0.00**	**$122.80**	**$122.80**
Site Characterization - Surveying, 2-man Crew	7.00 DAY		*$120.0000*	*$5,292.3000*	*$0.0000*	
99041201		D	100.00%	100.00%		
			$840.00	**$37,046.10**	**$0.00**	**$37,886.10**
Site Characterization - Sampling, Layout and Planning	1.00 EACH		*$15,405.2400*	*$1,201.3900*	*$1,678.2600*	
99041202		D	100.00%	100.00%		
			$15,405.24	**$1,201.39**	**$1,678.26**	**$18,284.89**
On-Site Mobilization	1.00 0.15		*$16,500.0000*	*$0.0000*	*$0.0000*	
99060201		D	100.00%	100.00%		
			$16,500.00	**$0.00**	**$0.00**	**$16,500.00**
Transportation	1.00 Locat		*$15,000.0000*	*$5,696.4300*	*$25,000.0000*	
99060401		D	70.00%	100.00%		
			$21,428.57	**$5,696.43**	**$25,000.00**	**$52,125.00**
Decontamination and Demobilization	1.00 0.15		*$5,900.0000*	*$2,100.0000*	*$4,000.0000*	
99060501		D	100.00%	100.00%		
			$5,900.00	**$2,100.00**	**$4,000.00**	**$12,000.00**
Contractor Costs / General Conditions Total			**$170,272.81**	**$47,860.92**	**$57,010.26**	**$275,143.99**

Landfill Disposal

Equipment, effluent treatment, utilities, and site excavation/hauling

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Equipment - 34' Automatic Inclined Conveyor, 24" Belt, Monthly Rental	1.00 MONTH		*$0.0000*	*$8,386.4100*	*$0.0000*	
33188403		D	70.00%	100.00%		
			$0.00	**$8,386.41**	**$0.00**	**$8,386.41**
Equipment - Feed Hopper, Steel, Monthly Rental	1.00 MONTH		*$0.0000*	*$6,521.0400*	*$0.0000*	
33188501		D	70.00%	100.00%		
			$0.00	**$6,521.04**	**$0.00**	**$6,521.04**
Equipment - 5' by 16' Double tray vibrating screen, Monthly Rental	1.00 MONTH		*$0.0000*	*$16,222.9200*	*$0.0000*	
33188602		D	70.00%	100.00%		
			$0.00	**$16,222.92**	**$0.00**	**$16,222.92**
Excavation/Hauling - Bulk Solid Haz Waste Loading Into Truck	6,668.00 CY		*$0.3800*	*$1.0800*	*$0.0000*	
33190102		D	70.00%	100.00%		
			$3,619.77	**$7,201.44**	**$0.00**	**$10,821.21**
Excavation/Hauling - Load Drums on Disposal Vehicle	20.00 EACH		*$1.4200*	*$0.7600*	*$0.0000*	
33190103		D	70.00%	100.00%		
			$40.57	**$15.20**	**$0.00**	**$55.77**
Excavation/Hauling - Transport Bulk Solid Haz Waste, Max 18 Ton Load (per Mile)	65,000.00 MILE		*$0.0000*	*$0.0000*	*$3.4400*	
33190206		D	70.00%	100.00%		
			$0.00	**$0.00**	**$223,600.00**	**$223,600.00**
Equipment - 2 for 1 month, Backhoe/Frontloaders, Monthly Rental	2.00 MONTH		*$0.0000*	*$8,291.2000*	*$0.0000*	
33190303		D	70.00%	100.00%		
			$0.00	**$16,582.40**	**$0.00**	**$16,582.40**
Equipment - Shovels	8.00 EACH		*$0.0000*	*$0.0000*	*$8.7000*	
33190304		D	70.00%	100.00%		
			$0.00	**$0.00**	**$69.60**	**$69.60**
Equipment - 20 Gallon 17E Open Head Steel Drum	20.00 EACH		*$0.0000*	*$0.0000*	*$21.4900*	
33190405		D	70.00%	100.00%		
			$0.00	**$0.00**	**$429.80**	**$429.80**

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Effluent Treatment - Wastewater Disposal Fee	17,800.00 GAL		*$0.0000*	*$0.0000*	*$1.2500*	
33197102		D	70.00%	100.00%		
			$0.00	**$0.00**	**$22,250.00**	**$22,250.00**
Excavation/Hauling - Landfill Haz Solid Bulk Waste by Ton	9,400.00 TON		*$0.0000*	*$0.0000*	*$178.2100*	
33197263		D	70.00%	100.00%		
			$0.00	**$0.00**	**$1,675,174.00**	**$1,675,174.00**
Equipment - 13' x 13' x 17" Containment Berm	1.00 EACH		*$0.0000*	*$0.0000*	*$7,037.8300*	
33199902		D	70.00%	100.00%		
			$0.00	**$0.00**	**$7,037.83**	**$7,037.83**
Utilities - Electrical Charge	10,000.00 KWH		*$0.0000*	*$0.0000*	*$0.0750*	
33420101		D	70.00%	100.00%		
			$0.00	**$0.00**	**$750.00**	**$750.00**
Utilities - Phone Monthly Charges	2.00 MONTH		*$0.0000*	*$0.0000*	*$220.0000*	
33420120		D	70.00%	100.00%		
			$0.00	**$0.00**	**$440.00**	**$440.00**
Utilities - Water, Supplied	40.00 KGAL		*$0.0000*	*$0.0000*	*$8.0700*	
33420301		D	70.00%	100.00%		
			$0.00	**$0.00**	**$322.80**	**$322.80**
	Landfill Disposal Total		**$3,660.34**	**$54,929.41**	**$1,930,074.03**	**$1,988,663.78**

Professional Labor

Labor

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Project Engineer	120.00 HOUR		*$80.0000*	*$0.0000*	*$0.0000*	
33220105		D	100.00%	100.00%		
			$9,600.00	**$0.00**	**$0.00**	**$9,600.00**
Engineer	160.00 HOUR		*$60.0000*	*$0.0000*	*$0.0000*	
33220110		D	100.00%	100.00%		
			$9,600.00	**$0.00**	**$0.00**	**$9,600.00**
Trucker	120.00 HOUR		*$37.7100*	*$0.0000*	*$0.0000*	
33220111		D	100.00%	100.00%		
			$4,525.20	**$0.00**	**$0.00**	**$4,525.20**

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Site Superintendent/HSO	360.00 HOUR		*$40.0000*	*$0.0000*	*$0.0000*	
33220113		D	100.00%	100.00%		
			$14,400.00	**$0.00**	**$0.00**	**$14,400.00**
Field Technician	760.00 HOUR		*$30.0000*	*$0.0000*	*$0.0000*	
33220117		D	100.00%	100.00%		
			$22,800.00	**$0.00**	**$0.00**	**$22,800.00**
Professional Labor Total			**$60,925.20**	**$0.00**	**$0.00**	**$60,925.20**
Sampling and Analysis						
Sampling and Analysis						
Drying and Grinding	30.00 EACH		*$0.0000*	*$0.0000*	*$21.4900*	
33020208		D	70.00%	100.00%		
			$0.00	**$0.00**	**$644.70**	**$644.70**
Air Monitoring Station	3.00 EACH		*$0.0000*	*$0.0000*	*$1,841.9800*	
33020301		D	70.00%	100.00%		
			$0.00	**$0.00**	**$5,525.94**	**$5,525.94**
Cement Mixer, Monthly Rental	1.00 MONTH		*$0.0000*	*$0.0000*	*$355.5100*	
33020311		D	70.00%	100.00%		
			$0.00	**$0.00**	**$355.51**	**$355.51**
Personal Low Flow Sampling Pump, Monthly Rental	1.00 MONTH		*$0.0000*	*$0.0000*	*$227.1800*	
33020314		D	70.00%	100.00%		
			$0.00	**$0.00**	**$227.18**	**$227.18**
Disposable Materials per Sample	50.00 EACH		*$0.0000*	*$0.0000*	*$50.3800*	
33020401		D	70.00%	100.00%		
			$0.00	**$0.00**	**$2,519.00**	**$2,519.00**
Targeted TCLP (Metals Only) and Total Metals Analyses	50.00 EACH		*$0.0000*	*$0.0000*	*$95.2000*	
33021705		D	70.00%	100.00%		
			$0.00	**$0.00**	**$4,760.00**	**$4,760.00**
1 Liter, 32 oz, High-density Polyethylene Bottle, Case of 12	4.00 EACH		*$0.0000*	*$0.0000*	*$35.9200*	
33022030		D	70.00%	100.00%		
			$0.00	**$0.00**	**$143.68**	**$143.68**

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
250 ml, 8 oz, High-density Polyethylene Bottle, Case of 24	4.00 EACH		*$0.0000*	*$0.0000*	*$45.3100*	
33022032		D	70.00%	100.00%		
			$0.00	$0.00	$181.24	$181.24
Overnight Delivery, 11 - 20 Lb Package	20.00 EACH		*$0.0000*	*$0.0000*	*$22.5800*	
33022041		D	70.00%	100.00%		
			$0.00	$0.00	$451.60	$451.60
Mobile Laboratory Trailer, 8' W x 30' L, Rental	1.00 MONTH		*$0.0000*	*$0.0000*	*$4,297.9600*	
33029913		D	70.00%	100.00%		
			$0.00	$0.00	$4,297.96	$4,297.96
Gas Chromatograph, HP5890A, Rental	1.00 MONTH		*$0.0000*	*$0.0000*	*$2,762.9700*	
33029914		D	70.00%	100.00%		
			$0.00	$0.00	$2,762.97	$2,762.97
Polyethylene Drum, 30 gallon	10.00 EACH		*$0.0000*	*$0.0000*	*$32.6200*	
33199921		D	70.00%	100.00%		
			$0.00	$0.00	$326.20	$326.20
Engineer	120.00 HOUR		*$60.0000*	*$0.0000*	*$0.0000*	
33220110		D	100.00%	100.00%		
			$7,200.00	$0.00	$0.00	$7,200.00
Field Technician	120.00 HOUR		*$30.0000*	*$0.0000*	*$0.0000*	
33220117		D	100.00%	100.00%		
			$3,600.00	$0.00	$0.00	$3,600.00
Sampling and Analysis Total			$10,800.00	$0.00	$22,195.98	$32,995.98
Site Total			$245,658.35	$102,790.33	$2,009,280.27	$2,357,728.95
Project Total			$245,658.35	$102,790.33	$2,009,280.27	$2,357,728.95

The three data items in the labor and equipment columns are: unit cost, productivity, and total cost. The two data items in the materials column are: unit cost and total cost.

Battelle Memorial Institute

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On-Site S/S

Project Description: This process is done on-site with solidification materials. In this case, Portland cement will be used to stabilize any absorbed metals remaining in the soil after an initial screening process to remove particulate metals. The screened metals will be transported to a smelter for recycling.

Location: Fort Polk, LA

Localization Zip Code: 000

Sites: 1

Estimator: Battelle Memorial Institute

Preparation Date: Thursday, May 15, 1997

Total Direct Cost: $1,370,473.81

Fort Polk, LA

Site Description: Small-arms ranges at Fort Polk, LA are contaminated with particulate and absorbed lead, and other various metals.

Site Type: Small-arms Range

Contaminants, Media: Lead, Copper, Zinc, and Antimony.

Depth to Groundwater: feet

Other Costs: Site preparation and sampling and analytical costs are also factored into the overall treatment cost.

Schedule/Duration: 1/1/98 through 5/1/98 2 Week Start Up Period 4 Month O&M Period

Type of Work: RI/FS or RFI/CMS? No Remedial Design? No Remedial Action? Yes

Treatments/Processes: 10,000 tons of contaminated soil will be excavated and screened. The remaining soil will be stabilized with Portland cement and sodium silicate. After stabilization the soil will be returned to the berm.

Contractor Costs / General Conditions	$565,039.99	Permitting and regulatory, site characterization, vendor selection, bench-scale testing, site preparation and support, engineering and administrative, transportation, on-site mobilization, and decontamination and demobilization.
Discharge to POTW	$44,499.16	Effluent Treatment
Professional Labor	$101,000.00	Labor
Sampling and Analysis	$81,998.16	Sampling and Analysis
Solidification/Stabilization	$577,936.50	Equipment, site excavation/hauling, chemicals, utilities, and residuals.
Total Cost for the Site:	**$1,370,473.81**	

On-Site S/S

Battelle Memorial Institute

5/15/97

This process is done on-site with solidification materials. In this case, Portland cement will be used to stabilize any absorbed metals remaining in the soil after an initial screening process to remove particulate metals. The screened metals will be transported to a smelter for recycling.

Battelle Memorial Institute

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Fort Polk, LA

Small-arms ranges at Fort Polk, LA are contaminated with particulate and absorbed lead, and other various metals.

Lead, Copper, Zinc, and Antimony.

10,000 tons of contaminated soil will be excavated and screened. The remaining soil will be stabilized with Portland cement and sodium silicate. After stabilization the soil will be returned to the berm.

Site preparation and sampling and analytical costs are also factored into the overall treatment cost.

Contractor Costs / General Conditions

Permitting and regulatory, site characterization, vendor selection, bench-scale testing, site preparation and support, engineering and administrative, transportation, on-site mobilization, and decontamination and demobilization.

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Consumables and supplies	1.00 EACH		$0.0000	$0.0000	$24,047.0000	
33010404		D	70.00%	100.00%		
			$0.00	$0.00	$24,047.00	$24,047.00
Bench-scale Testing	1.00 EACH		$17,739.0000	$0.0000	$0.0000	
33029929		D	100.00%	100.00%		
			$17,739.00	$0.00	$0.00	$17,739.00
Consumables and supplies - Diesel Fuel	1,000.00 GAL		$0.0000	$0.0000	$1.4500	
33420201		D	70.00%	100.00%		
			$0.00	$0.00	$1,450.00	$1,450.00
Vendor Selection	1.00 EACH		$135,686.0000	$0.0000	$0.0000	
99010101		D	100.00%	100.00%		
			$135,686.00	$0.00	$0.00	$135,686.00
Permitting and regulatory	1.00 Locat		$73,199.0000	$0.0000	$0.0000	
99030602		D	100.00%	100.00%		
			$73,199.00	$0.00	$0.00	$73,199.00

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Engineering and Administrative	1.00 EACH		*$41,000.0000*	*$0.0000*	*$0.0000*	
99040101		D	100.00%	100.00%		
			$41,000.00	$0.00	$0.00	$41,000.00
Site Preparation and Support - Temporary Office 32' x 8'	2.00 MONTH		*$0.0000*	*$0.0000*	*$338.6500*	
99040102		D	70.00%	100.00%		
			$0.00	$0.00	$677.30	$677.30
Site Preparation and Support - Construction Signs	10.00 SF		*$0.0000*	*$0.0000*	*$15.2500*	
99040401		D	70.00%	100.00%		
			$0.00	$0.00	$152.50	$152.50
Site Preparation and Support - Portable Toilets (2), Monthly Rental	2.00 MONTH		*$0.0000*	*$0.0000*	*$345.6000*	
99040501		D	70.00%	100.00%		
			$0.00	$0.00	$691.20	$691.20
Site Characterization - Surveying, 2-man Crew	7.00 DAY		*$120.0000*	*$5,292.3000*	*$0.0000*	
99041201		D	100.00%	100.00%		
			$840.00	$37,046.10	$0.00	$37,886.10
Site Characterization - Sampling, Layout, and Planning	1.00 EACH		*$15,405.2400*	*$1,201.3900*	*$1,678.2600*	
99041202		D	100.00%	100.00%		
			$15,405.24	$1,201.39	$1,678.26	$18,284.89
On-Site Mobilization	1.00 0.15		*$22,228.0000*	*$0.0000*	*$0.0000*	
99060201		D	100.00%	100.00%		
			$22,228.00	$0.00	$0.00	$22,228.00
Transportation	1.00 Locat		*$21,800.0000*	*$16,977.1400*	*$50,000.0000*	
99060401		D	70.00%	100.00%		
			$31,142.86	$16,977.14	$50,000.00	$98,120.00
Site Preparation and Support - Plant Construction and support	1.00 Locat		*$0.0000*	*$14,580.0000*	*$59,299.0000*	
99060402		D	70.00%	100.00%		
			$0.00	$14,580.00	$59,299.00	$73,879.00
Decontamination and Demobilization	1.00 0.15		*$9,900.0000*	*$2,100.0000*	*$8,000.0000*	
99060501		D	100.00%	100.00%		
			$9,900.00	$2,100.00	$8,000.00	$20,000.00
Contractor Costs / General Conditions Total			$347,140.10	$71,904.63	$145,995.26	$565,039.99

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Discharge to POTW						
Effluent Treatment						
Discharge and Disposal Fee	35,579.00 GAL		*$0.0005*	*$0.0000*	*$1.2500*	
33197102		D	70.00%	100.00%		
			$25.41	**$0.00**	**$44,473.75**	**$44,499.16**
	Discharge to POTW Total		**$25.41**	**$0.00**	**$44,473.75**	**$44,499.16**
Professional Labor						
Labor						
Project Engineer	160.00 HOUR		*$80.0000*	*$0.0000*	*$0.0000*	
33220105		D	100.00%	100.00%		
			$12,800.00	**$0.00**	**$0.00**	**$12,800.00**
Engineer	320.00 HOUR		*$60.0000*	*$0.0000*	*$0.0000*	
33220110		D	100.00%	100.00%		
			$19,200.00	**$0.00**	**$0.00**	**$19,200.00**
Site superintendent/HSO	360.00 HOUR		*$40.0000*	*$0.0000*	*$0.0000*	
33220113		D	100.00%	100.00%		
			$14,400.00	**$0.00**	**$0.00**	**$14,400.00**
Chemist	240.00 HOUR		*$50.0000*	*$0.0000*	*$0.0000*	
33220114		D	100.00%	100.00%		
			$12,000.00	**$0.00**	**$0.00**	**$12,000.00**
Field Technician	1,420.00 HOUR		*$30.0000*	*$0.0000*	*$0.0000*	
33220117		D	100.00%	100.00%		
			$42,600.00	**$0.00**	**$0.00**	**$42,600.00**
	Professional Labor Total		**$101,000.00**	**$0.00**	**$0.00**	**$101,000.00**
Sampling and Analysis						
Sampling and Analysis						
Drying and Grinding	30.00 EACH		*$0.0000*	*$0.0000*	*$14.4900*	
33020208		D	70.00%	100.00%		
			$0.00	**$0.00**	**$434.70**	**$434.70**
Air Monitoring Station	3.00 EACH		*$0.0000*	*$0.0000*	*$1,841.9800*	
33020301		D	70.00%	100.00%		
			$0.00	**$0.00**	**$5,525.94**	**$5,525.94**

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Cement Mixer, Monthly Rental	2.00 MONTH		*$0.0000*	*$0.0000*	*$355.5100*	
33020311		D	70.00%	100.00%		
			$0.00	**$0.00**	**$711.02**	**$711.02**
Personal Low Flow Sampling Pump, Monthly Rental	2.00 MONTH		*$0.0000*	*$0.0000*	*$227.1800*	
33020314		D	70.00%	100.00%		
			$0.00	**$0.00**	**$454.36**	**$454.36**
Targeted TCLP (Metals Only) and Total Metals Analyses	500.00 EACH		*$0.0000*	*$0.0000*	*$85.9200*	
33021709		D	70.00%	100.00%		
			$0.00	**$0.00**	**$42,960.00**	**$42,960.00**
1 Liter, 32 Oz, Clear Wide Mouth Jar, Case of 12	10.00 EACH		*$0.0000*	*$0.0000*	*$46.2600*	
33022020		D	70.00%	100.00%		
			$0.00	**$0.00**	**$462.60**	**$462.60**
250 ml, 8 Oz, Clear Wide Mouth Jar, Case of 24	6.00 EACH		*$0.0000*	*$0.0000*	*$65.7200*	
33022022		D	70.00%	100.00%		
			$0.00	**$0.00**	**$394.32**	**$394.32**
Overnight Delivery, 11 - 20 Lb Package	30.00 LB		*$0.0000*	*$0.0000*	*$22.5800*	
33022041		D	70.00%	100.00%		
			$0.00	**$0.00**	**$677.40**	**$677.40**
Mobile Trailer, 4' W x 15' L, Rental	2.00 MONTH		*$0.0000*	*$0.0000*	*$2,844.3250*	
33029913		D	70.00%	100.00%		
			$0.00	**$0.00**	**$5,688.65**	**$5,688.65**
Gas Chromatograph, HP5890A, Rental	1.00 MONTH		*$0.0000*	*$0.0000*	*$2,762.9700*	
33029914		D	70.00%	100.00%		
			$0.00	**$0.00**	**$2,762.97**	**$2,762.97**
Polyethylene Drum, 30 Gallon	10.00 EACH		*$0.0000*	*$0.0000*	*$32.6200*	
33199921		D	70.00%	100.00%		
			$0.00	**$0.00**	**$326.20**	**$326.20**
Engineer	240.00 HOUR		*$60.0000*	*$0.0000*	*$0.0000*	
33220110		D	100.00%	100.00%		
			$14,400.00	**$0.00**	**$0.00**	**$14,400.00**

Item	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Field Technician 33220117	240.00 HOUR	D	*$30.0000* 100.00% $7,200.00	*$0.0000* 100.00% $0.00	*$0.0000* $0.00	 $7,200.00
Sampling and Analysis Total			**$21,600.00**	**$0.00**	**$60,398.16**	**$81,998.16**

Solidification/Stabilization

Equipment, site excavation/hauling, chemicals, utilities, and residuals.

Item	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Site Excavation/Hauling 17030201	10,000.00 TON	D	*$7.3700* 100.00% $73,700.00	*$5.0490* 100.00% $50,490.00	*$0.0000* $0.00	 $124,190.00
Equipment - Crawler-mounted, 5.5 CY, Hydraulic Excavator 17030235	240.00 HOUR	D	*$26.0300* 70.00% $8,924.57	*$207.5200* 100.00% $49,804.80	*$0.0000* $0.00	 $58,729.37
Equipment - 580K, 1CY, Backhoe with Front-end Loader 17030431	240.00 HOUR	D	*$21.4000* 70.00% $7,337.14	*$14.3600* 100.00% $3,446.40	*$0.0000* $0.00	 $10,783.54
Residuals - Waste shipping and handling 33010462	1.00 EACH	D	*$0.0000* 70.00% $0.00	*$0.0000* 100.00% $0.00	*$87,500.0000* $87,500.00	 $87,500.00
Chemicals - Portland Cement Type I (Bulk) 33150405	2,350.00 TON	D	*$0.0000* 70.00% $0.00	*$0.0000* 100.00% $0.00	*$87.1900* $204,896.50	 $204,896.50
Chemicals - Sodium Silicate (Bulk) 33150414	200,000.00 LBS	D	*$0.0000* 70.00% $0.00	*$0.0000* 100.00% $0.00	*$0.0900* $18,000.00	 $18,000.00
Equipment - Nonpressurized Water System for 10 CY Waste Mixer 33150426	1.00 EACH	D	*$0.0000* 70.00% $0.00	*$0.0000* 100.00% $0.00	*$2,045.8300* $2,045.83	 $2,045.83
Equipment - Belt Feeder for 10 CY Mixer, 13' Long 33150428	1.00 EACH	D	*$0.0000* 70.00% $0.00	*$0.0000* 100.00% $0.00	*$12,636.0000* $12,636.00	 $12,636.00

	Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total
Equipment - Solidification/Stabilization Ancillary Items	1.00 EACH		*$0.0000*	*$0.0000*	*$18,164.0000*	
33150435		D	70.00%	100.00%		
			$0.00	**$0.00**	**$18,164.00**	**$18,164.00**
Equipment - Maintenance of Solidification/Stabilization Unit	2.00 MONTH		*$37.4500*	*$0.0000*	*$0.0000*	
33150437		D	70.00%	100.00%		
			$107.00	**$0.00**	**$0.00**	**$107.00**
Equipment - 5' x 16' Double-tray Vibrating Screening Unit, with Motor & Accessories	1.00 EACH		*$654.8700*	*$222.9200*	*$27,335.0100*	
33188602		D	70.00%	100.00%		
			$935.53	**$222.92**	**$27,335.01**	**$28,493.46**
Equipment - 50 GPM, 100' Head, 3 HP, Centrifugal Pump	1.00 EACH		*$281.4200*	*$4.4600*	*$1,891.7600*	
33290103		D	70.00%	100.00%		
			$402.03	**$4.46**	**$1,891.76**	**$2,298.25**
Equipment - 10 HP, 250 GPM, Centrifugal Pump	2.00 EACH		*$404.5400*	*$6.4100*	*$1,849.4500*	
33290109		D	70.00%	100.00%		
			$1,155.83	**$12.82**	**$3,698.90**	**$4,867.55**
Utilities - Electrical Charge	10,000.00 KWH		*$0.0000*	*$0.0000*	*$0.0750*	
33420101		D	70.00%	100.00%		
			$0.00	**$0.00**	**$750.00**	**$750.00**
Utilities - Phone Monthly Charge	2.00 MONTH		*$0.0000*	*$0.0000*	*$220.0000*	
33420120		D	70.00%	100.00%		
			$0.00	**$0.00**	**$440.00**	**$440.00**
Utilities - Water	500.00 KGAL		*$0.0000*	*$0.0000*	*$8.0700*	
33420301		D	70.00%	100.00%		
			$0.00	**$0.00**	**$4,035.00**	**$4,035.00**
Solidification/Stabilization Total			**$92,562.10**	**$103,981.40**	**$381,393.00**	**$577,936.50**
Site Total			**$562,327.61**	**$175,886.03**	**$632,260.17**	**$1,370,473.81**
Project Total			**$562,327.61**	**$175,886.03**	**$632,260.17**	**$1,370,473.81**

Quantity/Unit	Safety Level	Labor	Equipment	Materials	Total

The three data items in the labor and equipment columns are: unit cost, productivity, and total cost. The two data items in the materials column are: unit cost and total cost.